THE

THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A MONTHLY JOURNAL

OF

Practical Therapeutics

EDITED BY

H. A. HARE, M.D.,

Professor of Therapeutics and Diagnosis in the Jefferson Medical College,

GENERAL THERAPEUTICS;

AND

EDWARD MARTIN, M.D.,

Formerly Professor of Surgery in the University of Pennsylvania,

SURGICAL AND GENITO-URINARY THERAPEUTICS.

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ORIGINAL COMMUNICATIONS.

THE VALUE OF THE LABORATORY TO THE SURGEON.[1]

BY JOHN B. DEAVER, M.D.,

Professor of Clinical Surgery in the University of Pennsylvania, Philadelphia.

It is an honor and a pleasure for me to attend a meeting of the Bellevue Hospital Medical Society, whose sponsor is so well known wherever medicine is practiced and whose annals contain a long list of names that have helped to make American medicine illustrious. I take it that your membership comprises men in all branches of the profession, and that you may perhaps be interested in hearing in an informal way of what value the laboratory is to the surgeon.

The introduction of modern laboratory aids in diagnosis may in some minds have raised the hope that the royal road to diagnosis might at last be found. But we now know that the golden path is as elusive as ever. It might also have looked as though there would be everything to gain and nothing to lose by the routine use of laboratory tests as diagnostic aids. A consideration of the profit and loss to medicine resulting from the innovation, of course, leaves the balance on the profit side. But the debit side is not entirely blank. There is a danger to the profession of a loss of that nicety of judgment and critical acumen acquired by a delicate sense of touch and the proper correlation of the results of keen clinical observation, and a carefully taken history which distinguished the diagnostician of former days. The young man to-day is especially apt to be lacking in this respect, and by the time he realizes that too great reliance on laboratory tests has often led him astray, he will have lost precious time in acquiring the habit of keen insight and coördination which is so largely a matter of experience.

During the course of a professional career in a busy hospital equipped with all the essential apparatus of a modern institution of its kind, and where the annual number of operations totals more than three thousand, I have so often been impressed with these facts that I have thought it worth while to study the actual facts as to the value of the laboratory as an aid to diagnosis. (I wish here to express my thanks to my internes, Doctors Best, Magoun, Rice, and Replogle, for their assistance in gathering the statistics on which my remarks are based.)

The most valuable and reliable information which we are to-day receiving from the pathological laboratory is that from frozen sections on the question of malignancy. In 362 frozen sections made during the years 1916 and 1917, the findings were subsequently confirmed by microscopic examination in 358 instances, making the almost negligible figure of one per cent of error. Three of the errors reported malignancy in specimens which proved to be benign, and in one instance a supposedly benign growth was found to be malignant. This favorable showing is not obtained from any other of the diagnostic aids, with perhaps one ex-

[1] Read before the Bellevue Hospital Medical Society, New York, October 2, 1918.

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ception, which we propose briefly to consider.

Take the blood count, for example. Although time did not permit gathering figures on this point, we find it, as a rule, a reliable index of anemic conditions, and a high leucocytosis is taken as an indication of inflammation or hemorrhage. That this is not always the case is seen from the very frequent observation in acute appendicitis, for instance, of delayed operation where the differential count has been favorable and where operation reveals gangrene and perforation.

In blood cultures we find that the results are valuable only when they are positive. A negative test is unreliable. Furthermore, the test also loses any value which may attach to it from a surgical point of view on account of its time-consuming technique, the slow growth of certain organisms, such as streptococcus viridans, etc.

In upper abdominal conditions too much stress should not be laid on *x*-ray and fluoroscopic reports, nor on the results of gastric analysis and the examination of stools for occult blood, etc.

As far as the latter is concerned, we all know that unless the patient has been kept on a meat-free diet for some time the results are vitiated on account of the presence of meat fibers in the excreta. And in a test meal the presence of occult blood does not necessarily indicate bleeding, since it may often be due to trauma caused by the careless passage of the stomach tube and to retching.

The acidity of the gastric contents so often deviates from the expected that it also cannot be relied upon as a guide. In our duodenal ulcer cases, for instance, the free and total acidity were normal in 25 per cent, while 13 per cent showed subacidity. In a number of cases ulcer was suggested by the gastric analysis, while operation revealed carcinoma, engrafted on ulcer, it is true. In gall-bladder disease the value of the test meal is very questionable. Our figures give almost equal percentages for hyperacidity (30.2 per cent), subacidity (36.6 per cent), and normal acidity (33.1 per cent).

The *x*-ray and the fluoroscope for the detection of peptic ulcer and of gall-bladder disease I have come to regard as very much overrated so-called instruments of precision. In more than 40 per cent of peptic ulcers a negative report was returned from the *x*-ray department, while ulcer was demonstrated at the subsequent operation. In not a small number of cases the reports read "suggestive of ulcer" when the condition is actually due to abnormal peristalsis; or an indicated deformity of the duodenal cap is in reality found to be due to other causes, such as gall-bladder disease. So neither the positive nor the negative report is always reliable.

It can readily be seen how reliance on a negative report may lead to abstention from operation, with a consequent trail of years of suffering under medical treatment of what is essentially a surgical condition in which the clinical symptoms are to-day so well established. The following is a flagrant instance of this kind.

In April of this year a physician, aged fifty-six years, was referred to me by one of our best internists, Dr. M. H. Fussell. He gave a history of about nine years of periodic attacks of upper abdominal distress after eating. After having suffered these attacks for five years he consulted Dr. Fussell, who from the very clear-cut symptoms made a diagnosis of duodenal ulcer; the usual tests, including *x*-ray and fluoroscopic examination, were applied. As they all proved negative, medical treatment was instituted with temporary relief. The attacks recurred during the next three years, and at each one the same tests were made and consistently proved negative. The last *x*-ray report read: "The phenomena are not incompatible with gall-bladder disease." The patient was then referred to me. The history was unmistakably that of duodenal ulcer. Operation was finally decided on. A large indurated ulcer was found on the anterior portion of the third part of the duodenum. A pylorectomy was done, followed up by gastroenterostomy. The patient made a good recovery and has been relieved of his symptoms.

I think you will agree that *x*-ray and

fluoroscopic examination for supposed ulcer should be made only by an expert who is not satisfied with one or two plates, but considers it essential to take a series of fifty or more, and only if the same abnormal or normal conditions are present in each can he consider the picture positive or negative, as the case may be.

Another instance of the unreliability of negative *x*-ray findings is seen in the following case, in which the picture, made by one of the most expert roentgenologists in the country, was negative except for ptosis and intestinal stasis. The patient was later admitted to the Lankenau Hospital of Philadelphia, with a history of constant and progressively increasing pain and soreness in the epigastrium for several weeks past. There was no history of any serious previous gastric disturbance. Physical examination revealed mid-epigastric tenderness and rigidity and a definite resistance as from an underlying mass; also bulging in the flanks with shifting dulness. A diagnosis of gastric carcinoma was made. At the subsequent exploratory operation a large nodular inoperable mass was found involving the head of the pancreas, the primary seat of the growth, with secondary extension to the liver and the stomach. There was nothing to do but close the abdomen and leave the patient to his inevitable fate.

These are not extreme cases by any means. They are met with frequently—indeed, far too frequently. I venture to say that too firm a faith in negative laboratory findings is in the long run responsible for more economic waste, more suffering, and more untimely journeys to the "bourne from which there is no returning" than is exploratory laparotomy, which if it occasionally does no good, at least does no harm.

In our gall-bladder cases, both with or without stones, *x*-ray failed to show the condition in 52 per cent. I cannot think that our experience is unique in this respect, and the conclusion seems inevitable that diagnosis in these is still a matter of education gained by experience.

Nor have we found any satisfaction in the estimation of the cholesterol content of the blood as an aid in diagnosing gall-bladder disease. Taking 200 milligrammes as the upper limit of the normal, in 66 operated cases 17 out of 28 with gall-stones showed a cholesterol content above 200 milligrammes. In 38 cases without stones 26 gave a reading below the normal. Furthermore, the analysis of the cases showed that the cholesterol content of the blood may be affected by other upper abdominal conditions, and therefore a hypercholesteranemia has little, if any, significance in the differential diagnosis of cholelithiasis.

Having pointed out some of the shortcomings of the Roentgen-ray it behooves us, and we do so with pleasure, to indicate where it has proved its worth. We find that in urinary calculus the stone was detected by the *x*-ray in plus 88 per cent of the cases. Errors are sometimes made in the case of ureteral stones because the shadow is often not due to the presence of a stone in the ureter but to phleboliths or calcified lymph glands outside of the canal. It is for this reason that in suspected ureteral stones we prefer to confirm a positive *x*-ray finding by cystoscopic examination.

We finally come to the kidney functional tests, the blood urea and phenolphthalein percentages. Upon these accurate procedures we have come to depend for indications of renal activity and the ability of the kidneys to throw off solids—in other words, of the surgical risk involved in a given case.

In a series of 420 tests, the cases comprising peptic ulcer, gall-bladder disease, urinary calculus, pyonephrosis, hypertrophied prostate, a favorable result for kidney function was obtained in 403; operation therefore seemed safe. There was but one death from uremia—a prostatic. There were 17 in which the results indicated poor kidney function. Operation was undertaken, in these otherwise hopeless cases, as a last resort. Seven deaths from uremia resulted: four prostate cases, two ureteral calculus, and one pyonephrosis.

The question of risk in such instances is one of the embarrassments of the profession. Sometimes, however, the surgeon is spared the decision by the patient himself. Mr. —— came to the Lankenau Hospital of Philadelphia, giving a history of right

nephrectomy for stones and infection; later stones were also removed from the left kidney, and following this also from the left ureter. After the last operation a ureteral fistula developed and persisted, necessitating the insertion of a tube in the pelvis of the ureter; the patient was voiding all the urine through this tube. I advised against operation and sent the man home. A few weeks later he returned begging for operation, claiming that death was preferable to the insupportable life he was leading. Estimation of renal function at this time confirmed the clinical evidence of the poor operative risk, blood urea being 76 per cent and phenolphthalein elimination but 5 per cent. The man was told that all chances were against him, but nevertheless he persisted. The operation consisted of ureterovesical anastomosis. The patient died of uremia.

Two other cases, too recent to be included in the foregoing series, likewise illustrate the probable unfavorable outcome of operation undertaken in the presence of abnormal results of these kidney functional tests.

One, a case of pyonephrosis, was *in extremis* on admission, with death a certainty without operation. In the hope of saving life, operation was undertaken in spite of a blood urea of 96 per cent, and phenolphthalein of 6 per cent. The patient died on the fifth day, having passed only 20 Cc. of urine after operation.

In another instance, carcinoma of the breast of two years' standing, the condition justified intervention although blood urea stood at 111 per cent and phenolphthalein at 5 per cent. A radical operation was done. Death from uremia.

In the two-stage operation on the genitourinary apparatus, particularly in prostate cases, in which owing to the advanced age of the patients and the not infrequent presence of back pressure on the kidneys, the value of these tests in determining the most favorable time for the second operation can only be appreciated by one who has had much experience in this class of work.

I believe that in some quarters I have been accused of ignoring the laboratory in the course of my work. I think I have shown that this is far from being so. Although I do not hesitate to point out its shortcomings, I also appreciate its inestimable value. Without the laboratory medicine could not possibly have made the strides it has, and furthermore, I believe that team work between the internist, the laboratory man and the surgeon is not only the most essential element for the success of all three, but likewise best serves the interest of the patient.

THE TREATMENT OF PERITONITIS—A CLINICAL LECTURE.

BY E. E. MONTGOMERY, M.D., LL.D., F.A.C.S.,
Professor of Gynecology in the Jefferson Medical College, Philadelphia.

Since I sat on the benches I have seen marked changes in teaching on this subject. Its character as an infection had been recognized by a few brilliant minds, while that form which so frequently complicated the puerperium was attributed by the majority of the teachers to a special poison which produced the condition denominated puerperal fever.

It is true that Willard Parker as early as 1848 had explicitly described appendicitis, and a little later Oliver Wendell Holmes had made known the true character of puerperal fever and demonstrated that it was similar to surgical infections. In all lines of progress some time must pass before the investigations of individuals permeate the mass of the profession, or even the particular class with which they are associated, to a sufficient degree to be accepted. In the meantime old ideas prevail and govern the methods of procedure.

Thus in 1875, when an interne in the Philadelphia Hospital, I went direct from the surgical wards, where I had cases of erysipelas and numerous cases of infected wounds under my care, to the obstetrical wards without any special preparation.

All the patients were confined on the same leather-covered mattress which was only wiped off between cases, and as you would naturally expect there was an immediate epidemic of what we then denominated puerperal fever, in which several patients lost their lives and in many of them the illness took the form of peritonitis.

No greater step in advance has been made in the practice of obstetrics than when it was universally accepted that the parturient woman is especially vulnerable to infection and that her greatest security is attained when she is treated as a surgical case.

The recognition of the causes of peritonitis is of the utmost importance. Like inflammation in other parts of the body, peritonitis is primarily protective. Its existence is an evidence that nature has made an effort to ward off or prevent the spread of infection which has found entrance. In this sense it may be curative; thus a threatened perforation of stomach or intestine, an impending rupture of an ovarian cyst, or a tubal gestation, the escape of blood or the contents of viscera into the peritoneal cavity lead at once to the pouring out of exudate to wall it off and guard against the spread of infection, and we have a localized peritonitis. The site of this localization will necessarily depend upon the source from which the offending material is derived.

The forms of peritonitis which will most frequently confront you as students of gynecology are pelvic and general—the former when the inflammation is confined to the pelvis. Peritonitis having its origin in the pelvis is generally walled off, but this will depend upon the virulence of the infection and the resistance of the patient. It may vary from simple adhesive inflammation to the accumulation of serum or pus, in the production of which again virulence and resistance are important factors. The infection may find entrance through the uterus and tubes, the blood-vessels, the lymphatics, or the walls of the intestines. In the latter, the infection has generally been preceded by the presence of an accumulation or a foreign body. The accumulation may follow perforation of an ulcer in the gastrointestinal tract, hemorrhage from a ruptured varicose vessel, the end of the Fallopian tube, and the latter may or may not be associated with ectopic pregnancy.

You would infer that a pelvic inflammation arose from infection associated with the genital organs, and this would be a natural inference when the accumulation was found walled off behind the uterus, but do not take too much for granted. I have seen pus discharged through the vagina which had originated from an abscess subsequent to perforation of the intestine in typhoid fever. Abscesses of the pelvis are not uncommonly associated with tuberculous inflammation of the peritoneum. Any free fluid in the peritoneal cavity will gravitate into the pelvis and may there become encysted from its own irritating properties, but most frequently infection reaches the collection through the intestines. It is not unusual to find the appendix hanging over the brim of the pelvis, and inflammation of such an appendix would naturally lead to a pelvic accumulation. Such an accumulation bulging the vaginal wall, unless a careful analysis of the previous history is employed, may readily be ascribed to tubal disease, especially if the patient has recently been confined or had an interruption of pregnancy by abortion.

It should be remembered that a history of pregnancy does not necessarily preclude the existence of appendicitis. The more carefully the surgeon studies his cases the less the number of mistakes he will have to register, but with all the care he can exercise, with the aid of long observation and good judgment, there will still remain a number of cases in which the final diagnosis must depend upon the result of treatment. The most frequent source of mistake in the female is right-sided inflammation which may have originated in the tube, ovary, appendix, gall-bladder, or have resulted from renal or ureteral disease. The line of work the investigator pursues will lead

to a certain obsession which increases the danger of being misled in a particular case. The general surgeon may conclude the appendix is at fault, and subjecting the patient to operation find the appendix but little inflamed and still overlook the actual seat of the disease in the tubes. Numerous examples have occurred in my experience in the practice of prominent men where such conditions were overlooked, and the patient continuing to suffer. A subsequent operation on the pelvic organs brought about relief. Repeated experiences of this kind naturally discredit the surgeon and surgery.

In order to avoid such unpleasant results and afford the patient the surest relief to which she is entitled, a careful history should be secured as to the course and development of the disease with the associated symptoms, which should be supplemented by a painstaking investigation of the involved region through the rectum and vagina with conjoined inspection and palpation of the abdomen. Where the physical signs fail to account for the pain and discomfort experienced, a chemical and microscopic examination of a catheterized specimen of urine should be made. The finding of pus and blood-corpuscles in this may demonstrate that the disease is of urinary origin. The presence of a mass in the right side, well above the pelvis, which cannot be connected with the uterus and pelvic structures by abdomino-vaginal palpation, justifies the conclusion that the appendix is responsible.

The remaining source of error develops in those cases in which the appendix is situated low in the pelvis and an accumulation follows its infection. Such an accumulation may fill up the post-uterine pouch and produce the sensation of fixation of the pelvic organs with exudate into the peritoneum and vaginal wall. Where such a condition occurs in a woman previously in good health with the hymen unruptured it is pretty safe to ascribe it to some other lesion than one of the genital structures.

With the most careful analysis there will remain a limited number of cases in which it will be impossible to be positive as to the origin of the lesion. In such cases the subsequent progress must determine the condition and the course to be pursued.

The presence of peritonitis is made known by severe pain in the abdomen, most generally over the portion in which the inflammation originates. The patient shows but little inclination to move from her back and will have her limbs drawn up to relax the abdominal muscles and protect the surface from the weight of the clothing. Nausea and vomiting are almost constant, associated with distention of the abdomen from accumulation of gas. This distention may involve the lower part of the abdomen or the hypogastric region. The vomiting may be large quantities of black foul-smelling fluid or the extrusion of small quantities so frequently repeated that the patient has an almost constant regurgitation of dark-colored fluid. The upper part of the stomach is distended, and the introduction of the stomach tube will be followed by the evacuation of a large quantity of the fluid. The respiration is shallow and frequent and the pulse is rapid, feeble, and wiry. The countenance is anxious, distorted with pain, and the general appearance of the patient is anything but encouraging. The temperature is elevated, varying from 100° to 103°. It is sometimes normal or even subnormal, and in the latter case there is frequently free pus in the cavity. When your patient has had an elevated temperature with severe pain and the temperature becomes subnormal with disappearance of the pain, it is wise to suspect the occurrence of gangrene or the formation of pus.

In the study of a case recognized as peritonitis, it is important not only to be sure that such an inflammation exists, but to be assured as to the particular structure in which it has originated. As you may readily infer from what I have told you, it is not always possible to be certain as to its origin.

In the instance before us the patient entered the hospital March 25th, 1918; age, forty-seven years. She has been twice pregnant. The labors have been premature,

and both children died. Her last period occurred on the 12th, two weeks before admission. For a week before admission she had complained of severe, but diffuse, abdominal pain, and for two days severe vomiting, a distressing irritability of the bladder, and diarrhea. The abdomen was distended, extremely tender, and resistant on both sides. Vaginal examination showed induration over the posterior fornix and every indication of an accumulation behind the uterus.

The situation of the accumulation led to the diagnosis of a tubal infection. On the 27th of March an incision was made through the posterior vaginal fornix evacuating a large quantity of pus. A split rubber drain was inserted and the Murphy drip employed. She stood the operation well and showed marked improvement. With the removal of the drain there was a lighting up of the abdominal symptoms, and thinking that there had been a retention of pus the opening was broken open with the finger and drainage resumed. She continued to grow worse, so that on the 12th of April I brought her before you at the clinic, made a median incision, and directed my course to the pelvis, expecting to find pus in the tubes, but much to my surprise they were not affected beyond being bound down with the adhesions which were common to the abdominal viscera. I next turned my attention to the appendix, which had become gangrenous and sloughed; the contents of the bowel escaped from the open base of the appendix. After carefully cleansing the cavity this opening was sutured. The adhesions were separated further to the right and above, when a large collection was opened beneath the liver in which there was a pint of foul-smelling pus, and another collection was found in the upper abdomen to the left. These collections were washed out with a salt solution and drains brought out in each lumbar region through stab wounds. A third drain was brought out through the opening in the vagina.

Her convalescence was a stormy one, and the abdominal wound partially broke down with discharge of foul-smelling pus, which led the interne to think that an intestinal fistula had occurred, but as the infection in such cases is generally the colon bacillus the blood or fluid infected by it has the regular fecal odor. She left the hospital on June 2 with wounds healed.

A case of appendicitis, when seen early, should be subject to immediate operation, and thus the gravity of a severe attack of peritonitis can be obviated. In tubal disease the immediate operation is not so desirable for the reason that it necessitates a sacrificial operation when delay may obviate it. Another reason is that the infection, if anything, is more virulent than that associated with appendiceal inflammation and early operation endangers the spread of the infection. You will remember that another patient was brought before you during the winter in whom there had been a large accumulation of pus in the abdomen which had become so viscid that it could not be washed out, and we had to scoop it out with the hand through an abdominal incision. This patient too recovered.

Peritonitis having developed, what shall be the course of treatment? The abdomen is distended, there is vomiting of a dark-brown material which has a very offensive odor. It is useless to administer food, for it is not absorbed and undergoes decomposition, adding to the toxemia of the patient. The administration of purgatives is valueless because the paralysis of the intestines and the reversed peristalsis prevents their passing through the intestine. In all inflammatory troubles rest is of the greatest value, for anything which increases the activity of the circulation spreads the infection. Clark advocated morphine in peritonitis and this I practiced successfully in the Philadelphia Hospital in 1875. Ochsner planned the treatment of such cases by morphine, abstinence of food by the stomach, and support through the Murphy drip, with the patient in the Fowler or semi-Fowler position. The morphine, given for effect and continued in lessened doses, insures rest, both mental and physical, and converts the patient from a condition of discomfort

to one of ease and indifference. It is important that the patient should be kept from solicitous friends and relatives.

The patient with peritonitis under morphine is in danger from the accumulation of material in the stomach and intestine which cannot be evacuated by the bowel, so it remains, undergoes decomposition, forms gas, which increases the intestinal distention, produces pressure against the heart, interferes with its action, and by pressure on the lungs prevents sufficient oxygenation. Such a patient suffers a profound toxemia causing a rapid feeble pulse, an anxious countenance, and an appearance which seems to portend approaching dissolution. These unpleasant symptoms are obviated by gastric lavage, which still further insures against exhaustion through the almost continuous efforts at vomiting. The lavage should be repeated with recurrence of vomiting and for the relief of the abdominal distention.

The patient must be supported, and the large quantities of liquid drained from the tissues through the accumulation in the stomach and intestine be replaced. It is true that a small quantity of the fluid may be absorbed through the stomach and small intestine, as is evidenced by the toxemia from the material absorbed which has undergone decomposition, but the most effective avenue for absorption is the large intestine, and it can be supplied through the anus and most effectively by the continuous drip as devised by Ochsner. It supplies the fluid as it can be absorbed. As the greater part of the tissues of the body are made up of water it supplies the fluid most needed to carry on the work. With the complete rest, waste is not rapid, and through the large quantities of water absorbed, the toxin products which have formed are most effectively eliminated. In mild forms of infection such a course may be sufficient to bring about resolution; where it is not effective, it prepares the patient for the further ordeal. The natural tendency of an inflammatory process is to become localized and results in the presence of pus accumulations in different parts of the body. As the pelvis is the most dependent portion of the abdomen all collections tend to gravitate to it, unless they are so irritating that they lead to wide-spread infection.

The recognition of an accumulation justifies measures for its evacuation, and the ease with which a collection can be reached through the vagina makes it the safest course by which to secure its removal. It has the additional advantage that it permits the evacuation with the least disturbance of the barriers Nature has erected against the spread of infection. If the distention is not apparent through vaginal palpation the vaginal route should not be considered, but the abdomen should be opened. If the pus is evidently walled off, the incision should be made over the mass, rather than have to break down the barriers from within the abdomen to enter the collection.

Where the suppuration is diffuse it is important to make sure that all pockets are opened and efficiently drained. With drains inserted and the continuous proctoclysis employed the peritoneal cavity is practically washed, as the transudation of the fluid into the peritoneal cavity is very rapid. The most effective drains are either wicks of gauze wrapped with rubber tissue or a split rubber tube. The latter may very well follow the wick drain. The drain should reach the bottom of the cavity. The treatment of peritonitis may be summarized as follows:

1. Absolute rest of the patient in bed under the care of a prudent, tactful nurse, excluding as far as possible all solicitous relatives and friends. Rest (*a*) of the gastro-intestinal tract through the exclusion of purgatives or even food by the mouth; (*b*) gastric lavage where the patient is vomiting or there is distention of the upper abdomen; (*c*) by placing the intestines in a splint through the frequent administration of morphine hypodermically.

2. Maintenance of nutrition and promotion of elimination through continuous proctoclysis with normal salt or glucose solution delivered into the rectum at the rate of twenty to thirty drops every minute, the

patient so placed as to cause the fluid to gravitate to the internal end of the drain. Where several drains have been employed the position of the patient should be frequently changed so that drainage shall be equally effective from each of the affected cavities. Should the support of the patient prove inefficient, the proctoclysis may be supplemented by a hypodermoclysis of a pint of salt solution twice daily under each breast. When the proctoclysis is not retained it may be employed at two-hour intervals and its nutritive value increased by the use of white of egg, peptonized milk, bouillon and other readily absorbed articles of food.

3. The promotion of resistance to infection by the employment of heat over the abdomen, especially after the acute symptoms have subsided.

4. Resort to surgery for drainage when it is evident that suppuration is localized, and where possible, effect the drainage through the vagina.

5. Avoid too early interruption of the morphine, and too early resort to gastric feeding. When the patient begins to pass flatus by the bowel or a free fecal evacuation occurs may be considered an indication for discontinuaance of the morphine and for feeding, but the change should be carefully made. Purgation even at this stage should be avoided. Convalescence is necessarily slow, and will be promoted by careful feeding, judiciously selected tonics, and encouragement to take exercise.

Note.—The patient first named is now under my care for ventral hernia and diastasis of the recti muscles. When I opened the abdomen I was greatly surprised at the few adhesions found. My experience is that in the majority of these extensive infections subsequent adhesions are not an element of much importance.

LUMBAR PUNCTURE IN HEAD INJURIES.

BY LIEUTENANT ROBIN C. BUERKI, M C., U. S. A.

In a little over two months there were admitted to the services of Dr. Edward Martin and Dr. John B. Deaver at the Hospital of the University of Pennsylvania, sixteen consecutive accidents showing signs of concussion, all of which recovered and were discharged cured. The length of unconsciousness in these cases varied from a period of fifteen minutes to nine days. Five of the sixteen cases remained unconscious for over twenty-four hours.

Of this series the positive diagnosis of fracture was made by the *x*-ray in six cases. Of the remaining ten cases three showed clinical signs of fracture of the base—*i.e.*, prolonged bleeding from the posterior pharyngeal wall and serous bloody oozing from the ears—while two others were in the list of those remaining unconscious for more than twenty-four hours.

The treatment in all of these cases consisted in keeping the patient in bed, regulation of the bowels, abundance of fluids, and medication reduced to the minimum. In the two longest cases of unconsciousness, rectal administration of glucose and soda bicarbonate was practiced.

The blood-pressure, which was taken every second hour for the first twenty-four hours and thereafter three times daily, was used as an indication for the necessity of surgical intervention. In none of this series was decompression considered at all necessary.

It would seem, then, that routine decompression and lumbar puncture, which in itself is not diagnostic and which in a certain small percentage of cases is accompanied by disastrous results, is used simply as a means of satisfying the idle curiosity of an overenthusiastic or perhaps uncertain surgeon.

This small series of consecutive recoveries in no way proves that a non-operative procedure is the only method of treatment, but it does show that this method of masterly inactivity and watchful waiting has its place in the treatment of head injuries.

NOTES ON TETANUS.

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The following notes on the prophylaxis and the treatment of tetanus were given to me during my service in a British base hospital, and were compiled by the War Office Committee for the Study of Tetanus:

(1) The Prophylactic Treatment of Tetanus.

From experiments it has been found out that the immunity conferred by an injection of antitetanus serum is lost or is considerably lessened after a period of ten days, therefore medical officers in the British army have been ordered to give every wounded man at least four injections: the first injection is given at the dressing station of a field ambulance as soon as the wounded man arrives there. The dose is usually 500 units, except in some cases of very extensive wounds, when 1000 units are given. The second injection should be given at an interval of seven days from the first dose, and the third and fourth doses should follow at the same interval of time or as soon after as practicable.

All cases of trench feet either with or without a breach of surface should also be given the serum, as many cases of tetanus developed in cases of trench feet.

Numerous cases of tetanus have followed operations which were performed at the site of wounds, so it has been decided to give a prophylactic injection of A. T. S. 500 units preferably two days before the operation, provided that the patient has not received an injection within seven days preceding the operation. It should be given subcutaneously, or if given twelve hours before the operation it should be given intramuscularly.

The antiseptics which prevent the anaerobic growth of the tetanus bacillus are the oxidizing antiseptics, among which are potassium permanganate and hydrogen peroxide; also the antiseptics which depend on the liberation of chlorine, as Dakin's solution, eusol, and dichloramine-T, which also render toxin non-injurious.

(2) Diagnosis.

To get the best results from treatment it is necessary that the diagnosis should be made before the classical symptoms of tetanus appear. Some of those who have had a prophylactic injection of antitoxin develop tetanus, but trismus and general symptoms may not occur at all. In these cases the only symptom might be a local spastic rigidity of the wounded limb. This might disappear or may develop into generalized tetanus. The motor nerve cells in the spinal cord which govern the muscles near the wound will be the first affected, which will be shown by spasticity and by increased reflex excitability of these muscles. Sometimes the patient complains of jumping or jerking or of stiffness in the wounded limb, which occurs chiefly at night. Whenever the wound is dressed it is a good plan to examine the muscles near it for the presence of rigidity or twitchings. The nurses who dress wounds should be instructed to report to the medical officer if the muscles near the wound are harder or show more rigidity than the muscles of the sound side. The muscles supplied by the fifth nerve are most commonly affected, so when trismus develops in a wounded man tetanus should be immediately suspected.

Often before definite symptoms develop we get an exaggeration of the deep reflexes. Knee and ankle clonus might be obtained, and also we often get a positive Babinski reflex.

(3) Treatment of Tetanus.

The success of treatment lies in an early diagnosis. Don't wait until lockjaw has developed before giving serum—5000 units given early in a case is more efficient than 50,000 later when the symptoms have become general.

Four methods are commonly used for giving the antitetanus serum, namely, subcutaneous, intramuscular, intravenous, and intrathecal.

The War Office Committee for the Study

of Tetanus reports that in cases of acute general tetanus the best method is to give large doses of antitoxic serum intrathecally, repeated in two, three, or four days in succession and combined with intramuscular injections.

Very large doses of serum should be given; 50,000 to 100,000 units may be administered during the first few days of treatment.

For the intrathecal injections it is advisable to withdraw 20 Cc. of cerebrospinal fluid and then to run in the serum. In no case is it to exceed 20 Cc. in amount; 16,000 units is the adequate single dose for the intrathecal injection. We should repeat the intrathecal dose daily for four days, at the same time giving supplementary doses, intramuscularly, of 8000 units.

Treatment with magnesium sulphate is not advised, as some risk attends its use, and it is doubtful if it has any advantage whatever.

IS CÆSARIAN SECTION JUSTIFIABLE IN ECLAMPSIA?

BRODHEAD, in the *New York State Journal of Medicine* for October, 1918, writes on this highly important subject. At the very beginning of his paper he emphasises his belief that probably in a very large percentage of cases of eclampsia and placenta previa, abdominal section is unwarranted and unjustifiable. When the child is dead or not viable, when the patient is in active labor, with the cervix partially dilated, or easily dilatable, and when the patient cannot have the advantages of a well-equipped hospital and the services of a competent surgeon, other methods of procedure may be not only more advisable, but absolutely indicated. On the other hand, increasing experience compels him to believe that in a considerable number of cases Cæsarian section is the safest, easiest, and most satisfactory method of treatment.

The Cæsarian operation for eclampsia, brought so prominently before the profession by Peterson in his paper presented in 1914, has now been used in a large number of cases. We recall that he found the maternal mortality in operations performed between 1908-1913 was 25.79 per cent. In one series of 91 cases by 13 operators, each with five or more cases to his credit, the mortality was 18.68 per cent, and in this series, excluding septic and moribund cases, the mortality was 13.15 per cent. Since 1908 and reckoning only the viable living child, the fetal mortality was 3.62 per cent. Including deaths of infants within the first few days the mortality rose to 10.69 per cent. Peterson claimed, and rightly so, that the operation has never been given a fair trial. Performed soon after the first convulsion, we feel confident that Cæsarian section, in primiparæ at or near term, with undilated cervices, soon after the first seizure, would give a lower mortality than Peterson's series, and, this being the case, would not the small fetal mortality be a very excellent reason for performing the operation? Many of the infants are toxic, but a prolonged labor with operative interference will surely increase the infant mortality, whereas a speedy delivery will greatly decrease the infant mortality. In a recent case, with a primipara at eight and a half months, he wished to perform Cæsarian section, but being unable to secure permission he tried out the conservative method, with large doses of morphine and the usual eliminative treatment, the patient failing to go into labor, although a De Ribes bag and rectal tube had been used to induce pains, and nearly forty-eight hours after the beginning of treatment, convulsions continuing, and no progress having been made, the child being still alive, it was necessary to complete delivery by the high forceps operation, a dead child being extracted. The mother made a good recovery, but he feels that had Cæsarian section been done the child could also have been saved, and at the time of delivery the mother was in far worse condition than when first seen, having received no benefit whatsoever from the long delay and conservative treatment.

In 1917, in the *American Journal of Obstetrics and Diseases of Women and Children*, Vol. lxxv, No. 5, BRODHEAD pub-

lished statistics of 174 published and unpublished cases from a large number of operators in various parts of the country. In this series of 174 Cæsarian operations, with eclampsia, 28 women died, a maternal mortality of 16.1 per cent. In at least one of the fatal cases the patient had been frequently examined and efforts had been made to deliver from below, with a fatal result which he feels should not be attributed to the method as applying to eclampsia cases. One of the women died of pneumonia, two weeks postpartum; another died of intestinal obstruction a few days after operation; one had a ruptured uterus at the time of operation and was septic; another was a case of neglected intense toxemia. Two patients died twelve hours after delivery in convulsions. Excluding these cases, the mortality was 12.2 per cent. In at least three of these seven fatal cases the progress would probably have been favorable had the Cæsarian been performed soon after the first attack. One hundred and fifty-four children were alive when the operation was done, and of these twenty-nine died, a fetal mortality of 18.8 per cent. This list of deaths includes a case of the writer's in which the fetal heart was very rapid before the section was done, and the child breathed several times before death, which certainly could not be attributed to the operation, as the child would have been still-born had the patient been treated by ordinary methods. Two of the deaths were in premature twins, and in one series of twenty-nine cases, six children died within ten days. In another series of twelve cases three very small premature infants died. Deducting the premature, poorly nourished infants of the series, which would probably have died in any event, the mortality certainly would have been much less than 18.8 per cent.

In order to obtain more statistics Brodhead has obtained, since his last paper, reports of thirty-nine (all but one Schachner's) hitherto unpublished sections, which are given in full in his article.

In this latter series there were 35 primiparæ, two multiparæ, and the parity was unknown in two.

Six of the mothers died, a mortality of 15.4 per cent. One patient who had had six antepartum convulsions died of shock two hours after the operation; one patient who had had many antepartum seizures died of eclampsia two days after the operation, convulsions continuing until death; one patient who had ten antepartum seizures died of toxemia; one patient with eight antepartum seizures died of toxemia a few hours after operation; one died of eclampsia after 23 postpartum convulsions, and one woman who had had eight antepartum seizures died without regaining consciousness, with two postpartum seizures.

He believes that had these women been subjected to section soon after the first seizure, the prognosis would have been much better.

Of the infants in this last series, only two premature infants died, a mortality of 5.8 per cent, a very creditable result. One of these children at seven and a half months died twenty-four hours after the operation, and another at seven months died within a short time.

It will be seen that the last three series of 39 sections give a very much better infant mortality (5.8 per cent) than the first series of 174 (18.8 per cent), the maternal mortality (15.4 per cent) being also somewhat lower.

Taking the two series together he has 213 sections, with 34 deaths, a mortality of 16 per cent. There were 188 living children, of whom 31 died, a fetal mortality of 16.5 per cent.

The field of operation has been extended also to the preëclamptic cases, which have not been included in his paper, and many operators, including Polak, Newell, Hare, Potter, Swain, Spaulding, Bandler, Poucher, R. E. Brown, and many others, have performed a considerable number of sections with very gratifying results.

Brodhead presents these figures with a mind open to conviction, but at the present moment he believes that the Cæsarian operation for eclampsia in primiparæ, at or near term, with a closed cervix, offers the best prognosis for mother and child.

EDITORIAL.

SOME ELEMENTARY FACTS ABOUT THE VALUE OF RADIUM IN SUPERFICIAL CANCER.

Doubtless many of our readers will recall the fact that we published in the original pages of the GAZETTE many months ago a contribution by Newcomet, in which he showed by reports and pictures some of the results that were obtained in treating malignant and other growths on the face by means of radium, and in our Progress columns from time to time we have called further attention to the employment of this substance as a therapeutic agent. The great cost of radium, combined with the fact that cases in which it is used are not commonly met with by the general practitioner, naturally limits the interest of this class of practitioners concerning its therapeutic efficiency, except in a rather academic sense. Nevertheless, it is important that this type of medical men should be familiar with what radium can accomplish in order that he may wisely advise those who consult him, and recognize the case which it will be proper for him to refer to those who are skilled in the use of this agent. So far as the use of radium in malignant growth is concerned, our knowledge is handicapped by the fact that the pathologist is as yet unable to tell us the causative factor underlying the disease, and just as many problems in syphilis, tuberculosis, and malaria became perfectly clear when the cause of these diseases was discovered, so will other facts become clear when the causes of carcinoma and sarcoma are revealed.

Although radium far exceeds any other known substance in its constancy, nevertheless, like everything else on earth, it is continually undergoing disintegration, although its decay is so slow that it is only diminished about one-half in quantity in an estimated period of seventeen hundred years. This disintegration is characterized by the discharge of particles from the atoms of radium in such a manner that its disintegration products can be recognized. In the first place we have what is known as radium emanation, which is of the nature of a gas and which can be collected in water and carried to a patient just as ammonia or chlorine gas can be taken from place to place, using water as a vehicle. This radium emanation is represented by some persons as being of value in certain disorders of metabolism, notably gout and chronic rheumatic affections. Most of it as placed on the market is almost valueless; because the number of Maché units contained in a given quantity of water is far too small to be of any value. Thus, some of the solutions which are put upon the market contain only a few hundred Maché units, whereas the best therapeutic results have been obtained in metabolic disorders, as, for example, in the Radium Institute in London, when as much as three million Maché units have been ingested per day. In the few cases in which we have used doses varying all the way from five hundred to three million Maché units per day, we have failed to see that it produced any material benefit.

These remarks, however, are beside the issue with which this article is intended to deal. From the gaseous product referred to above there evolves what is called radium A, and from radium A is derived radium B and C. When radium is kept in a tube, radium A, B, and C are being constantly given off, but are deposited upon its sides, and therefore the activity of the original mass remains practically constant. If, however, gaseous emanation is taken off or allowed to escape the gas rapidly disappears in much the same way that ammonia disappears from ammonia water, and loses its activity. From the breaking-down products A, B, and C, to which we have referred, three different kinds of rays are given off—Alpha, Beta and Gamma rays. When these rays come in contact with the tissues, the first two are readily absorbed, and do not penetrate deeply, although they exercise a marked superficial caustic effect, and it is for this reason that the Beta rays are chiefly

used in the treatment of superficial skin diseases or epitheliomata. The Gamma rays, on the other hand, are much more penetrating, even exceeding the *x*-rays in this power. They are not as abundant as the Alpha and Beta rays, but their full effect can be obtained by employing sufficient quantities of radium or using radium emanation which has been screened by platinum or lead to cut off the Alpha and Beta rays so as to allow the Gamma rays alone to reach the tissues.

These preliminary remarks of elementary character we trust have been of interest to our readers.

Greenough has contributed to the *Boston Medical and Surgical Journal* a report on the use of radium emanation, or gas, in the treatment of carcinoma of the mucous membrane of the mouth, the gas used being derived from one thousand milligrams of radium at Harvard University, the emanation being drawn off and then sealed in capillary glass tubes, by means of which it is taken to the hospital. Even in these sealed tubes, however, the emanation loses power and fresh ones are prepared every day. By varying the size of the tube the dose to the tissues can be readily modified.

As we have already pointed out, until we know more about the etiology of malignant growths and the actual changes which result in their development, it is difficult to determine the manner in which radium does good when it succeeds in producing a cure. Does it act as a cauterizing agent? Does it cause gradual necrosis of diseased cells which are more susceptible to it than the surrounding healthy ones? Or, again, does it cause overgrowth of connective tissue, which as it contracts diminishes the blood supply to the tumor, and possibly surrounds it? All three of these theories have ardent supporters, and possibly in some cases all three factors are active. One point in favor of the necrosis theory is that not infrequently the free application of radium results in marked evidences of irritation as if poisonous material, resulting from tissue breakdown, had been taken into the system.

It has long been known that where malignant growths are treated by the *x*-ray, or by radium, success depends directly upon their superficial character. The deeper the growth, the worse the prognosis. Some of the most distressing cases which are met with are those instances in which carcinoma develops in the mouth. All too frequently the remainder of the patient's existence is a living misery and operative interference only hastens the end. Although the post-operative mortality in these cases is so high, nevertheless we believe that it may be stated without fear of contradiction that the best surgical opinion and the best radiological opinion is strongly in favor of operation first and the use of radium afterward, provided, of course, that some peculiar condition does not exist which contraindicates operation, when radium may offer the only possible chance of relief—if not of cure, at least of arrest.

It is interesting in this connection to note the results of radium treatment in one hundred and thirty-nine cases of mouth cancer reported by Greenough. Out of thirty-nine of carcinoma of the lip, nineteen were treated with radium, with improvement in eight. Out of eight cases involving the palate, thirty-six the lower jaw, eleven the upper jaw, thirty-three the tongue and floor of the mouth, seven the tonsils, and five the cheek, radium was used in sixty-two, with improvement in only nine. In this connection it is well to remember that, as Greenough says, the extension to the cervical lymphatics determines the limit of effective treatment by radium. A local lesion can still be destroyed or modified, but the involvement of the neck not only indicates grave extension, but prohibits the use of the large amounts of radium which are essential, since it results in the destruction of the skin and secondary hemorrhages.

After all is said we must conclude that the combined treatment by operation and radium seems to be the most rational and effective method in these cases. The surgeon operates upon the area involved, and possibly the area secondarily involved, re-

moves as much tissue as he thinks wise, and, after this, the radium is applied.

Last of all, as in many other instances, being forewarned is being forearmed, and any persistent lesion of the mucous membrane of the mouth, if syphilis is excluded, after the expiration of the third decade of life, or even earlier, should put the physician on his guard; and even if there is a history of syphilis, and still further even if the presence of spirochetæ can be demonstrated, it is never to be forgotten that it is perfectly possible for a patient to have two diseases at one time. Greenough goes so far as to say that the existence of an open ulcer in the mouth of more than two weeks' duration, and especially if it possesses an indurated margin, raises the question of cancer. Jagged teeth which continually irritate a given spot should, of course, be removed. Excision of malignant growths in small pieces to make a diagnosis is usually condemned, since it opens up avenues for metastasis. Any operative procedure should be a radical one, should be performed by a competent surgeeon, and, after that, the patient referred to a competent radiologist, except in the superficial lesions about the margin of the lip, for example, or on the skin itself, when in some instances the use of radium, without preliminary operation, accomplishes all that is needful.

MEDICAL METHODS VS. SURGICAL PROCEDURE IN CHRONIC INTESTINAL CONDITIONS.

Some time since Woolley in concluding a paper dealing with constipation and intestinal autointoxication gave as one of his conclusions that surgical operation for intestinal stasis is not justifiable except as a last resort. We have called attention on a previous occasion to the opinion of other able abdominal surgeons to the effect that this statement is emphatically true, and we think it may be fairly stated at the present time that the vogue, which arose from the enthusiasm of Mr. Lane, of England, concerning kinks, veils, membranes, adhesions, dilatations, and other abnormalities of the intestinal tube and their relief by surgical procedure, is distinctly on the wane.

Bearing in mind Woolley's conclusion just quoted, and using it as a guide, we think there are few instances in which such measures will be attempted, and we believe that the cases will be few and far between when ultimate benefit will result to the patient who is operated upon, even if an abnormal condition is found at operation. All too frequently a postoperative state is induced which makes the patient's life as unbearable as before, if not more so.

We think our readers will be interested in a communication by Ordway to the *Boston Medical and Surgical Journal*, in which a plea for conservative measures instead of surgical interference is urgently put forward. As is well pointed out, there scarcely exists a neurasthenic or psychasthenic who has not had a disturbance of some part of the digestive system at some period of his disease, and while it may be important to break this vicious circle, it is equally manifest that neurasthenic individuals, while they may be good risks from the standpoint of surviving an operation, are bad risks so far as ultimate cure is concerned.

The profession in the past has been too ready to accept so-called intestinal autointoxication as a cause of many ills, the origin of which is difficult to determine. Diagnosis being demanded, the physicians of forty years ago found refuge in "malaria," and to-day, although its popularity is decreasing as a method of giving comfort by positive opinion, the diagnosis of influenza is often made when pyelitis, cholecystitis, or some other definite lesion is in reality at the bottom of the patient's discomforts. Now "autointoxication" is all too frequently taking the place of "malaria" and "influenza." Autointoxication, as the result of disorders of the processes of metabolism, is by no means rare, but it is yet to be proved that intestinal autointoxication is very common. The alimentary canal is built to absorb in its upper portion, and carefully arranged so as to absorb nothing but moisture from its lower portion.

In many instances a properly carried out rest cure to restore nervous energy, iron and arsenic to overcome the anemia, the regulation of the diet, both from the standpoint of maintaining nutrition and preventing the formation of toxic by-products, is what the patient really needs, and without doubt the enforced rest cure which follows a surgical operation is more responsible in a number of cases for the improvement of the patient than the operation itself. So, too, a careful examination of the digestive ability of the stomach and small intestine and a study of the condition of the stools, as representing efficient digestion of the various foodstuffs, aids the physician in getting at the underlying points in the case.

Simultaneously with the appearance of the paper we have just quoted, another has appeared in the *Interstate Medical Journal* by Camden, dealing with the non-surgical treatment of splanchnoptosis, which is a condition nearly related to, or constantly associated with, the displacements and disorders of the digestive system we have just described. He points out that in many instances splanchnoptosis, which in turn may result in impaired intestinal function, is the result of a badly poised body, with loss of normal fat pads, and lack of nervous energy. It is a remarkable fact that many persons, whose organs are very markedly out of place when examined by the *x*-ray, have no digestive disturbance whatever because their nervous energy is sufficient to overcome the mechanical difficulty. Camden strongly recommends the use of the Rehfuss tube in gastric study, the avoidance of large quantities of food and drink, which by their weight may carry down to an abnormal point the stomach and intestines, and the employment of general tonics, gentle laxatives, or refined mineral oil. Marked attention, too, should be paid to the posture of the patient and the manner in which he carries himself, and exercises should be carried out with patience and fidelity to develop those muscles which are weak so that they will hold the patient's body in a normal position, and properly support the abdominal contents. Cold bathing with similar measures are of advantage if the patient's reaction is good.

In regard to the use of artificial supports, Camden well says that the mistake which is usually made is to make the patient fit the support, rather than the support to fit the patient. Where the abdomen is pendulous it is easily held up, but where it is emaciated it is difficult to provide support, even by the use of pads. A belt is usually better than a corset. In some instances shoulder braces which make the patient hold himself in an approximately normal posture are of great value, and it goes without saying that clothing which is tight about the waist and divides the abdominal contents into two parts by its constriction should be carefully avoided.

ATROPINE TEST IN THE DIAGNOSIS OF TYPHOID INFECTIONS.

As we have repeatedly pointed out in editorial notes, it is much to be regretted that those who make tests of new diagnostic and therapeutic measures rarely report their results unless they are of a favorable character. In other words, investigations which lead to the conclusion that a certain proposition is valueless, or harmful, rarely see the light, whereas those who, for one reason or another, think that good results have been attained are all too prone to rush into print concerning them. So far as diagnosis is concerned our readers may remember that at one time it was suggested that methylene blue might be used hypodermically for the purpose of determining the presence of typhoid fever. Much more recently it has been suggested by a number of writers that atropine might be used hypodermically for the same purpose, it being claimed that it is characteristic of typhoid fever that full doses of atropine do not quicken the pulse in this disease as they do in persons who are in health or suffering from other maladies. So simple a method of adding to our diagnostic abilities, if it were efficacious and reliable, would, of course, be most important to the general practitioner. Doubtless a number of men have been led to em-

ploy this test and have not had a sufficient number of cases to enable them to determine its value.

Not long since Friedlander and McCord studied this question and made a report concerning it to the effect that the measure was valueless. This communication is not only important because of the conclusion at which they arrived, but also because we hope that it will encourage other medical writers to record their negative results as well as their positive ones.

Another point of interest in connection with their report is the dose of atropine which it was thought necessary to employ, namely, about a thirty-third of a grain, or, in other words, nearly five times the dose which is usually considered an average dose for this drug when given by means of the hypodermic needle. Any patient whose pulse-rate is not immediately increased by a dose of this size must surely have some condition present which powerfully antagonizes the influence of atropine upon pneumogastric nerves, and, furthermore, even if their results had been such as to encourage them to employ this dose, we question whether it would have ever become popular, since the dose of a thirty-third of a grain given hypodermically is so definitely toxic and so liable to produce a rise of temperature due to atropine and delirium that these two symptoms, added to those already present, would naturally be alarming both to the physician and to the patient's friends. Fortunately, atropine while powerful as a toxic agent is remarkably free from lethal properties, and therefore no very serious accident is liable to occur even if the test is used.

AMPUTATIONS AND ARTIFICIAL LIMBS.

This subject, of paramount interest at the moment because of some of the more than 400,000 amputations made necessary by wounds; of always vivid interest since industrial injuries the world over claim, perhaps, 10 per cent of this number each year, has been greatly helped because of the rapidly accumulating experience, the intensive study applied to it, and a close coöperation between the surgeon and the maker of artificial limbs; to such effect that the former has been willing to so modify his procedure when this has been possible, with maximum function as a result. Perhaps it is this factor, team work on the part of the surgeon, rather than increased skill on the part of the manufacturer, which has most largely contributed to a greater degree of usefulness in artificial limbs than has heretofore been customary.

In amputating in the presence of infection, it has been customary in war surgery to leave the wound widely open, either with short flaps or by a transverse section, traction being applied to the skin to secure sufficient length for the ultimate covering of the stump. The preferable sites of amputation are not matters of chance, but are definitely laid down (Review of War Medicine and Surgery, August, 1918).

In and about the shoulder 2 inches of bone represents the shortest stump which can be of value in activating an artificial limb. If this cannot be saved, the head of the bone should be left, as it is of advantage in fitting the glenoid cap.

In arm amputations, the bone level of greatest functional value is one inch above the condyles. In forearm amputations, unless 3 inches of bone can be left the requisite stump is without value as a lever. The bone level of greatest functional value about the wrist is that of the first joint, taking off the styloid process, since thus is conserved the power of pronation and supination. Every possible portion of the hand should be saved; short anterior and posterior flaps being the rule, except at the wrist, where long palmar flaps are used.

In the thigh a 2-inch stump measured from the pubes is the shortest that can be of value. In amputations required above this limit, a disarticulation is preferable. The most useful femur is that where the amputation is made an inch above the adductor tubercle.

Two inches of tibia is the shortest that can be of service. The bone level of great-

est functional value is at or just below the middle; 8 inches of bone being the artificial leg-maker's ideal. Amputation just above the ankle-joint could be made to function, but is difficult to fit.

Foot amputations anterior to the insertion of the tibialis anticus give useful stumps.

In all cases the periosteum should be cut through with a knife preferably above the level where the bone is to be divided, thus avoiding the probability of spur formation. Nerves should be drawn down strongly out of their sheaths and cut off an inch or more, lest they be caught in scar tissue. A sufficient amount of soft tissue should be drawn over the end of the bone.

Freedom from sensitiveness to pressure is the chief qualification of a good stump and is the measure of its capabilities for end-bearing. In addition to the measures usually adopted for lessening congestion and preventing exostosis of the bearing surface, viz., elevation of the part, bandaging, massage, hydrotherapy, electric-light baths, and electricity, particular emphasis must be laid upon the benefit derived from early functional use, careful graduated pressure on the end of the bone helping to give it a smooth and round shape. A surgeon should prepare the stump for end-bearing by the early institution and persistent use of the necessary measures. The routine for proper stump treatment is thus laid out:

"To meet all indications the plan of treatment must be systematic. While the incision is healing, at each dressing the stump should be moved to the full limit in the opposite direction to that in which a contracture is likely to develop. In forearm stumps, movement should be carried out in supination and extension; in upper arm amputations, in upward and backward motions; in the leg, in extension; and in thigh amputations, in extension (securing hyperextension) and abduction. It is usually advisable to keep all stumps elevated while the patient is recumbent, and therefore particular attention should be directed to thigh amputations because this position favors a flexion contracture; to counteract this tendency it is recommended that once or twice each day the pillow be removed from under the stump and placed under the buttock, thus allowing the stump to drop into hyperextension. Further, advantage should be taken of the position in which the stump is dressed in order to guard against the tendency to contracture; thus, in forearm stumps, where supination is hardest to control, the dressing should be applied so as to maintain the bones in this position. When the incision has had to be left open, movement of the joint in the other directions also should be added as soon as conditions permit.

"As soon as the wound is healed, or practically so, and while the patient is still confined to bed, the following routine (modified from Hirsch) is begun:

"The stump should be massaged for a period varying from ten to thirty minutes, once or twice a day, according to its size and position. The region of the incision should naturally be avoided for the first few times and care taken not to make undue tension on the fresh scar. As rapidly as the tolerance of the stump will permit, the depth and the force of the massage should be increased up to the full normal limits.

"After the massage, the stump should be redressed with a cotton dressing bandaged snugly in place, or, if it is well healed, a bias flannel bandage alone may be used. The latter, when properly applied in several layers, gives a firm, even pressure.

"The patient is directed to press the end of the bandaged stump against a cushion placed in the bed, or against a frame. This must be begun with care, pressure being made at first for only several minutes at four- or five-hour intervals; if there is no unfavorable reaction, it should be increased gradually up to five or ten minutes every two hours, and then every hour.

"After each pressure exercise, active movements of the stump are to be made in all directions, to the full limits of the joint motion, for three to five minutes. Later, some form of resistance movements may be added to advantage, in order to still further build up the strength of the muscles

controlling the stump, and so make the early use of the artificial limb more easy.

"Hydrotherapy in the form of hot packs or warm baths, or electric-light baths, are to be used as indicated to improve the circulation and hasten absorption. The contrast bath is particularly valuable, the rapid dilatation and contraction of the blood-vessels which it produces causing a marked improvement in the local vascular and nervous tone; the stump being plunged first into the hot water and then into cold, as rapidly as the patient can change it, for five or ten minutes.

"When the patient is able to leave the bed, the measures just outlined are to be continued, but in the case of leg amputations the pressure exercise is to be discontinued as described and direct weight-bearing on the stump begun. A stool of the proper height and a cushion are provided, and the patient, supporting himself with his hands, allows at first only a little weight to rest upon the bandaged stump; the amount of weight borne and the time are then gradually increased, in a manner similar to that used in the pressure exercise in bed, until the entire weight can be taken on the stump. The patient may then carefully begin to hammer on the stool with the end of the stump, in imitation of the pounding which takes place in walking with an artificial limb provided for end-bearing. As soon as the patient can stand alone for a long time without getting tired, and with no other support than that needed to balance himself, a temporary leg, properly provided for end-bearing, may be fitted and walking begun, crutches being used guardedly and dispensed with as soon as possible. For a long time, however, the patient should continue to practice standing on the bare stump on a hard surface three times a day."

Muscular weakness and limitation of motion are two of the chief causes of discouragement in learning the use of an artificial limb. The conservation of the full range of motion of the joints above the site of amputation is of particular importance. Therefore, movements of the joints should be begun as soon as the condition of the limb permits and persisted in until full mobility in all directions is assured. The many advantages in the early application of some form of artificial leg have been fully demonstrated in the present war. Provided with a simple appliance, the patient is soon able to walk without any other support than that offered by a cane. The plaster peg-leg has proven a very satisfactory appliance for this early use; it is cheap, comfortable, and efficient, and can be made by any one who understands how to properly apply a plaster-of-Paris cast. The plaster socket may be made with or without an inner cuff of felt. The amputated must be reëducated for both work and play.

INFLUENZA EMPYEMA.

The present epidemic with its inevitable sequels of pleural effusion and pulmonary abscesses suggests that a review of the surgical treatment of these conditions is timely. Though the infection has shown some variations both in bacteriology and pathology, it has in general been characterized by sudden onset, often dyspnea and cyanosis from the beginning, out of proportion to the pulmonary signs, the lesions of a bronchopneumonia and involvement of the pleura exceptional rather than the rule. This is in marked contrast to those hemolytic streptococcic infections so common and so deadly last winter.

The surgical treatment of pleural effusions, when they occur, seems fairly well formulated, this formulation having been evolved from contrasting the results of various methods as observed in many hundreds of cases. When fluid is present in such quantities as to interfere markedly with respiration, aspiration is advised. The aspiration is repeated as often as is indicated by the refilling of the chest and continued as long as it is efficient. The needle should have an abrupt bevel, a large lumen, and should be thrust through an anesthetized area of the sixth to the eighth intercostal space, preferably on the scapular line.

If as the fluid flows out it will be replaced by nitrogen or air there is a freer evacuation and the patient is spared the hacking, persistent cough which is doubtless at times a cause of sudden death. If the needle be introduced through a skin puncture made by a cataract knife, by the sense of feel alone the surgeon is usually aware when he has entered the pleura.

When the exudate becomes too thick to flow through a needle or a small calibered cannula, and when pressure symptoms are pronounced, or the toxemia is progressive, or the bacterial count of the exudate indicates a growing mass of infected matter, a larger opening is indicated. This is best accomplished with the minimum of trauma, since these patients are usually little prepared to stand even a slight degree of surgical shock. Clinical experience has shown that an intercostal opening made under local anesthesia answers well for a brief time. This opening should not allow free ingress of air—*i.e.*, should not become a sucking wound—and preferably should be so tubed that there is a constant slight negative pressure in the suppurating cavity, the idea being that the expanding lung should fill the space occupied by the purulent exudate. This may be accomplished by using a large trocar and cannula, as large as the little finger, and passing through the latter when it has entered the pleural cavity a drainage tube which neatly fits it, the drainage tube being closed at its distal end; the cannula is then slipped off and the free end of the drainage tube is passed beneath the surface of an antiseptic solution placed a foot and a half lower than the patient's chest. A Wolf bottle answers well for this purpose. Or the same end may be attained, but not so perfectly, by a flutter valve, most easily made by tying the finger of a rubber glove, with its end cut off, about the outer extremity of the rubber drainage tube. This allows the pus to escape, but by its collapse on inspiration prevents the entrance of air. In place of the trocar and cannula, a small incision may be carried through the intercostal space into the pleura, plugged by the gloved finger for a moment till the knife is discarded and a long hemostat picked up grasping the end of a large drainage tube which is distally clamped or furnished with a flutter valve. The plugging finger is withdrawn, the tube passed in its place, and secured by a skin suture.

The difficulty with intercostal drainage is incident to the fact that the tube shortly becomes plugged with thick fibrinous flakes. This has suggested the need of a primarily wide opening of the chest by a rib resection, the introduction of the hand and removal of the fibrinous flakes, and the maintenance of an exit for pus so free that back pressure is impossible. This method has had a fair trial and, in toxic cases, a heavy mortality. Fortunately the Carrel-Dakin irrigation insures a continued drainage even through a comparatively small tube, since the solution is a potent proteolytic and in a few days dissolves all the psuedomembrane with which it comes in contact. Moreover, it accomplishes a practical sterilization of the suppurating cavity, so that in at least one clinic closure of the external wound has been accomplished, leaving a large cavity which has subsequently been filled by the expanding lung.

The question as to the advisability of an artificial pneumothorax in these cases of acute pleural effusion has not yet been settled. It is quite certain that it will act as a much more efficient splint than a liquid collection, and that it makes aspiration less exhausting and more complete, and that subsequent adhesions between the costal and visceral pleura will be more advantageously placed than when air or nitrogen injections are not practiced. Its effect upon inhibiting a recurrence of exudate remains to be determined. Any one who has studied the autopsy findings of the influenza cases must be convinced that the cause of death is rarely the pleural exudate; that the suppuration when patients reach this stage is often multiple, loculated, interlobar, and intrapulmonary; that the large pleural effusions are as a rule simply contributing factors to the fatal termination; and that the most perfect surgical intervention must fail largely to benefit many, if not the majority, of these cases.

REPORTS ON THERAPEUTIC PROGRESS.

REST IN HEART DISEASE.

CORNWELL in the *Medical Record* of August 31, 1918, wisely emphasizes this measure. He thinks the first principle in the use of rest in heart diseases is to give it in a sufficient dose, and if a mistake is to be made to make it on the safe side by giving too much rather than too little; for giving too much rest rarely does harm to a cardiopath, while failure to give enough may imperil his chance of recovery or improvement; of all remedies the bed is the least harmful in overdose.

The full dose of rest means the horizontal position—feet in bed and head on pillow; and revolution of the body permitted only on its horizontal axis; and no debate on the bedpan question; and the sitting position allowed only when there is orthopnea.

Just how long a patient should remain in bed after compensation for the horizontal position has been apparently restored is not always easy to decide. In chronic valvular disease of inflammatory origin, occurring in adults, the writer's rule is to keep the patient in bed for at least one month after such apparent recovery. In the case of children, his rule is to keep the patient in bed indefinitely, that is, to refuse to set a definite time for getting up. It usually happens that if no such date is set, the patient will be kept in bed about long enough, for the parents usually will connive at disobedience of orders when the child has appeared well for a considerable time. Keeping a child in bed for a long time does him no harm, and it safeguards him to a considerable extent from recurrences of his original disease and starts him in training for the disciplined and restricted life which may be his lot.

In acute endocarditis absolute rest in bed should be maintained for at least three months after symptoms of the acute disease have passed away, whether or not signs of cardiac insufficiency were present.

In acute myocarditis and acute myocardial degeneration the length of time to which the rest in bed need be prolonged depends on the pathological changes in the heart, which changes cannot be accurately made out; but in any case in which pronounced signs or symptoms of myocardial degeneration were noted, the period of rest should be measured in months. In the mild cases which occur regularly in typhoid fever and give no pronounced symptoms, confinement in bed for at least two weeks after defervescence is usually sufficient; but in those cases of typhoid which show unduly rapid pulse, or in which a transient mitral regurgitant murmur is observed, the rest in bed should be continued several weeks longer, and the getting up made gradually and cautiously, and a close watch kept on the behavior of the heart during the process; if the pulse shows an excessive increase of rate on getting up, the patient should be put back to bed and kept there for several weeks before trying it again. In cases in which there has occurred a sudden dilatation of the heart it may be necessary to keep the patient in bed for many months. The writer has seen persistence for months and even years of irritability and weakness of the myocardium, manifested by tachycardia and shortness of breath on slight exertion, which seemed to be referable to undue haste in getting out of bed after an apparently moderate typhoid.

In diphtheritic myocarditis prolonged rest is highly necessary, and even if no special signs of cardiac involvement have been noted the heart should be safeguarded by at least several weeks absolute rest in bed after apparently complete recovery; and if such signs have been observed, three months' stay in bed may be considered the minimum requirement, with special restriction of activity for a subsequent period of not less than a year.

The simple pneumonic heart, without direct inflammatory involvement, presents an imperative indication for absolute rest, although, as a rule, for a short period only; in uncomplicated cases the patient can usu-

ally be allowed out of bed by the twelfth day after defervescence. During the active period of the disease the patient should be watched constantly, or, if that is not practicable, should be restrained, so as to prevent his sitting up or getting out of bed in delirium.

TESTING ASTHMATIC PATIENTS.

In the *Boston Medical and Surgical Journal* of August 29, 1918, WALKER reports a study of 400 cases. He reminds us that when a person is sensitive or anaphylactic to a particular substance, ill effects or certain symptoms are produced in that person by the entrance of that substance into his body. One type of ill effect or symptom is an attack of bronchial asthma. We also know that it is the protein element in that substance that causes asthma, and we must not lose sight of the fact that proteins are most widely distributed in nature. Therefore patients may be sensitive or anaphylactic to proteins, and if so these proteins may be the cause of bronchial asthma. Proteins enter the body by inhalation, by ingestion, by absorption, and by infection. Inhalation takes place through the respiratory tract and chiefly concerns the protein in the pollen of plants, in the emanations and hair of animals, in the flour of cereal grains, and in some kinds of dust. Ingestion has to do with the protein in food, and we know that foods, after entrance into the gastrointestinal tract, do cause asthma. Absorption, apart from inhalation and ingestion, concerns the conjunctivæ and to a less extent the skin. By infection we mean the presence of pathogenic bacteria in any part of the body, but more especially foci of infection located in the teeth, tonsils, nose, throat, and lungs. In the case of bacteria we have to deal with the protein element as well as with the infectious element.

There are several ways of testing a patient in order to determine whether or not he may be sensitive to protein. One commonly used method is known as the intradermal test, which, in our experience, has proved to be too sensitive and too delicate, if not erratic. The test which has proved to be safe and reliable as regards hay-fever and asthma is the skin or cutaneous test, which is performed as follows: A number of small cuts, each about one-eighth of an inch long, are made on the flexor surfaces of the forearm. These cuts are made with a sharp scalpel, but are not deep enough to draw blood, although they do penetrate the skin. On each cut is placed a protein, and to it is added a drop of tenth-normal sodium hydroxide solution to dissolve the protein and to permit of its rapid absorption. At the end of a half-hour the proteins are washed off and the reactions are noted, always comparing the inoculated cuts with normal controls on which no protein was placed. A positive reaction consists of a raised white elevation or urticarial wheal surrounding the cut. The smallest reaction that we call positive must measure 0.5 cm. in diameter, and any smaller reactions are called doubtful. Negative skin tests with protein rule out those proteins as a cause of asthma, and all proteins which give a positive skin test should be suspected as a cause of asthma. In the case of bacteria, however, the skin test has to do only with the protein element, so that even though bacteria give a negative test, they may still be a cause of asthma through their infectious nature, and the patient need not be sensitized to bacterial protein.

Of the 400 cases studied, 191 or 48 per cent gave a positive skin test and were therefore sensitive to some protein. According to sex, 53 per cent of the sensitive cases were males and 47 per cent were females; of the total number of males studied, 51 per cent were sensitive; and of the total number of females, 44 per cent were sensitive. Therefore, although the prevalence of asthma between the two sexes was about equally divided, the percentage of sensitive cases was a little higher among the males than among the females. While considering the above percentages of sensitive cases it should be borne in mind that doubtful and slightly positive skin tests are not being counted; only those reactions which were a distinct urticarial wheal

measuring 0.5 cm. or more in diameter are included, so that the number of sensitive cases is computed on a very conservative basis.

A positive skin test with several different proteins may mean that all of them are causing asthma at present, and that the others have been or may be in the future the cause, or even it may mean that none of the proteins are at present the cause, but that they have been the cause, and now secondary infection is the chief cause of asthma. Treatment will naturally reveal the present cause. Suffice it to say that positive skin tests by proteins which seem to have no bearing on the cause of asthma should be considered as danger-signals and not as false reactions; such positive tests should not be disregarded.

The treatment of sensitive cases is largely a matter of judgment in deciding which positive test should be first investigated. If the patient is sensitive to food proteins, such foods should be omitted from the patient's diet for at least a month in order to see what effect they have on the asthmatic condition. In this series of cases nearly all of such patients have been relieved of asthma. In a few instances, however, because of the associated bronchitis, autogenous sputum vaccines have been required in conjunction with the restricted diet. Attempts to desensitize the patient against offending food protein by the subcutaneous injection of or by feeding gradually increasing amounts of the protein have failed. We have reasons, however, for believing that total abstinence from the offending protein for a long interval automatically desensitizes the patient for that protein.

Patients who are sensitive to bacterial proteins may be successfully desensitized against such by treatment with vaccines of those organisms, but great care must be exercised not to give too large and too rapid an increase in the amount of vaccine. The first dose of vaccine should not be larger than one hundred million bacteria, and each succeeding dose should not be more than fifty million over the preceding dose.

Before treatment is undertaken for those patients who are sensitive to the protein of horse dandruff or hair and of pollens, skin tests must be done, using various dilutions of these proteins. Treatment should be begun with the dilution next higher than that which gave a positive test; the first dose should be small, usually 0.1 Cc., and each succeeding dose should not be more than 0.1 Cc. over the previous one.

THE DISAPPOINTMENTS OF VACCINE THERAPY.

In the *Lancet* of August 10, 1918, ADAMSON, who is in charge of the Skin Department of St. Bartholomew's Hospital, London, writes an article with this title. He is one who is disappointed. He asks, how are we to account for the comparative failure of curative vaccination as contrasted with the striking success of prophylactic vaccination? Is it not that in prophylatic vaccination we are dealing with a less intricate problem and a proceeding which is better supported by known facts than that which confronts us when we attempt to cure an already existing infection by means of vaccines?

It is easy to see that *preventive* vaccination has a sound foundation. The study of immunity reactions has established the general principle that when an animal becomes infected by a microörganism it is rendered, after a period of incubation, specifically supersensitized to the toxins of that microorganism—to use the expression of Von Pirquet, a condition of allergy or altered reactivity is produced. As a result of this allergic condition the animal is protected against a second infection. An attempt to produce a second infection gives rise to a reaction more violent than the reaction to the first infection, which has a shorter incubation period and which ends in spontaneous cure. The efficacy of prophylactic vaccination is demonstrated in the results of preventive vaccination against smallpox and against enteric fever.

But when we come to the cure of an already present infection we have altogether different conditions. The protection which

has been acquired against a second infection varies in degree and in the length of time it endures in different diseases. In certain infections the reaction is such that the infected organism completely overcomes the invasion and remains henceforth protected against the disease. This occurs in smallpox and in scarlet fever, among other complaints.

In a second class the patient, although protected against a second invasion from without, yet remains infected and is liable to new infections from within—that is, to autoinoculations. This occurs in tuberculosis and in syphilis.

In a third class the protection is apparently of but short duration and seems often to be followed by a period of increased susceptibility, so that new infections may easily take place. This is seen in streptococcal and in staphylococcal infections and in influenza, for example.

What we require to know in regard to the second and third of these classes is whether in a subject whose immunity development has been insufficient completely to overcome the infection we can by appropriate doses of vaccines so enhance the production of immune bodies—*i. e.*, so "build up" the resisting power of the system against a microbe which has entered the body—that the defeat of the invasion is assisted or completed; and whether we can do this without danger of disorganizing the mechanism of immunity and possibly lowering instead of raising the powers of resistance.

As Sir Almroth Wright has put it: "The body has the machinery for immunization, and you can play tunes upon it if you know the laws. If you do not happen to know the laws when playing upon it, it may be quite injurious."

The uncertainty of the results, for most part the disappointing results, of vaccine treatment should perhaps make us pause and ask: Are we at present in a position to play tunes upon the machinery of immunization by means of vaccines after the machinery has already been set in motion as the result of microbic infection?

It may be that vaccine treatment sometimes gives dramatically successful results, and we are perhaps justified in giving this treatment a trial in certain cases of infection where other treatments have failed. But the still prevalent tendency to employ vaccines indiscriminately in all sorts of complaints should be deprecated, because we are not really in a position to know when we may do good and when we may do harm by this treatment, since we have no means of estimating its effects in a person whose reactivity has been altered, perhaps profoundly altered, as the result of previous microbic infection.

The almost equally prevalent use of vaccines in diseases of non-microbic origin is perhaps of less consequence, but it is apt to delay the employment of a treatment more suited to the case and more efficient.

TREATMENT OF ACUTE SEPTIC GINGIVITIS.

EDGELOW in the *British Medical Journal* of July 27, 1918, thinks it is important to call attention to the quite unnecessary vigor with which acute septic gingivitis is not infrequently treated by wholesale extractions of the teeth. A very intractable and depressing affection if improperly dealt with, it is in reality very amenable to appropriate treatment, and that fairly quickly, the pain by which it is accompanied being speedily relieved.

The routine treatment I have found efficacious is, after thoroughly rinsing the mouth with an iodine wash, to apply tiny pellets of wool soaked in camphor and carbolic acid (equal parts) well up into each interdental gingival space for a few minutes; this quickly eases the pain produced by any instrumentation. A fresh paste made by mixing equal parts of thymol, dried alum, and oxide of zinc with the oily camphor-carbolic mixture is then carefully packed into the gingival spaces and round the necks of the teeth beneath the edges of the gum and allowed to remain there. A mouth-wash of "sanitas" is directed to be used after food, and the tooth-brush is forbidden during the treatment. I apply the

local paste every other day for ten days or so. After the second or third application there is decided amelioration of the troublesome conditions—sleeplessness, pain, bleeding, and malodor—and the patient expresses himself as feeling altogether better. The disease having been thoroughly scotched and the gums returning to a healthy condition, a simple astringent wash of alum and carbolic acid is all that is necessary to complete the cure. As a preventive to its recurrence I direct the patient to paint the gums every other day with the simple tincture of iodine, and to be particularly careful in maintaining a sanitary condition of his tooth-brush.

THE AMBULATORY TREATMENT OF HEMORRHOIDS.

FANSLER, in *Minnesota Medicine* for November, 1918, describes in his article a method for the treatment of hemorrhoids during which the patient may carry on his usual occupation. The ambulatory method has never been given the general attention it deserves, and in this paper he gives a simple method which renders it more popular. The method has been used successfully in his private practice, and at the University of Minnesota Dispensary. To date the most commonly used method for the cure of hemorrhoids has been their surgical removal under general anesthesia. This entails a ten-day stay in the hospital, a loss of time from business, and considerable pain and the usual fear of "an operation." Any method which will eliminate these obstacles is worthy of consideration.

In so far as treatment is concerned, it must be remembered that there are two general types of hemorrhoids, internal and external. As external may be designated those which lie within the grasp of the internal sphincter or below it. Also should be included the so-called skin tags which are usually old thrombotic piles. Concerning the treatment of this type of hemorrhoids there is an unanimity of opinion—excision. All agree that these may be easily excised in the physician's office under local anesthesia. The reason it is not done more frequently is that there is no advantage in removing the external hemorrhoids at the office when the patient has to go to the hospital to have the internal ones removed. By the procedure which Fansler describes the entire treatment may be carried out at the office, the internal hemorrhoids being injected and the external ones excised. The external piles are usually treated last unless they are tender and inflamed.

The procedure he uses for the external piles is as follows: If the patient is employed, the work is usually done on Saturday afternoon so that he may have Sunday to rest before returning to work on Monday. The night before the treatment he is given a Cc. pill, followed by saline in the morning. If convenient, he is given an enema shortly before treatment, but this is not essential. For treatment the patient is placed in the Sims position, and the area cleaned with fifty-per-cent alcohol. Each external hemorrhoid is then injected with a one-per-cent apothesine solution and a V-shaped piece removed from each tumor. This leaves some mucous membrane around the anal circumference, even though there has been a complete ring of hemorrhoids. If there are any bleeders they are crushed with a hemostat. A pledget of cotton or gauze soaked in 1:1000 adrenalin is placed against the area of operation and then a large cotton pad which is held snugly in place with a T-binder.

There has never been more than slight oozing of blood in any cases he has treated. If it were remembered that there are no vessels of any size below the sphincter, it would save considerable catgut and useless worry. The patient is directed to defer bowel movement for twenty-four hours and to keep the stool soft. For this he usually prescribes mineral oil. After each bowel movement he washes the parts with lysol, a teaspoonful to a quart of water; or boric acid, a teaspoonful to a pint of water. This is all the treatment necessary, although a mild dusting powder may be employed if

advisable. Confinement to bed is not necessary, and Monday he resumes his usual occupation. There is usually some pain for a few hours following the treatment, so he gives the patient one one-quarter-grain tablet of morphine, to be used if necessary.

Granting that the external piles can be treated at the office, the next step is to devise a method whereby the internal hemorrhoids may be cured. Briefly let us consider with what we have to deal. Extending above the internal sphincter for a distance of one and one-half inches is a plexus of vessels formed by the hemorrhoidal veins. This plexus entirely encircles the rectum. It is a varicosity of these vessels which forms our internal piles. The hemorrhoids may vary from a slight bulging of these vessels into the lumen of the rectum to the mass the size of a hen's egg which protrudes with every strain of defecation. Unless they are fibrosed or thrombosed by repeated inflammation, they are purplish in color, soft and velvety to touch, and easily compressible. They bleed from the slightest prick.

For these internal hemorrhoids four general methods have beeen devised and are being successfully used in office treatment. The first is the ligation of single hemorrhoids under local anesthesia; the second, electrolysis; the third, the injection of the hemorrhoid with some caustic so as to produce a slough; the fourth, the injection of some substance which will produce a fibrosis of the hemorrhoid, thus shrinking it and obliterating the vessels composing it. It is not the intention of this paper to go into details concerning the first three methods other than to say that they are being used by a number of men. The fourth method is the one which he usually employs and which he describes in detail.

Before describing the technique he points out some of the advantages and disadvantages of the method.

1. It will not produce a cure where the hemorrhoid is already hard and fibrous, but these are rare.

2. In all other cases a cure can be produced by this method, as thousands of successfully treated cases will testify.

3. It can be done with very little pain to the patient.

4. It does not detain the patient from work, and so eliminates the loss of time and hospital expense incident to an operation.

5. It eliminates the fear and dread of an anesthetic and "an operation."

6. It has the advantage of taking from two to six treatments to cure, whereas the operation can be completed at one sitting.

7. The mortality is as small or smaller than from the operative procedure.

Fansler realizes that this last statement may be doubted by many general surgeons and some proctologists. Death following hemorrhoidectomy is almost always due to sepsis, and it is the danger of sepsis which is generally advanced against the injection method of treatment. Among the men who have done the most rectal work there is a pretty generally admited mortality of one-tenth of one per cent. Naturally, this does not include the many cases of milder sepsis which recover. No one who has observed a large number of hemorrhoidectomies but will be struck with the large number of postoperative rises in temperature This is not to be wondered at when we consider the nature of the operative procedure The rectum cannot be made sterile for any length of time, and when the raw stumps are left exposed in the rectum, infection of slight or severe grade is certain to take place In every case the stumps will show a bacterial membrane. If this be caused by some harmless saprophyte or the colon bacillus, the constitutional reaction will usually be slight and transient, but if we are unfortunate enough to have a virulent streptococcus or staphylococcus present, then we have reason to fear serious trouble. With the injection procedure we do not have the excellent nidus of infection which the stumps offer. The site of injection is cleansed with iodine and alcohol, and the injection made with a fine hypodermic needle, which when withdrawn leaves practically no abrasion. If done properly, this

certainly offers a minimum chance of infection. He knows of but one death following injection, and he is not certain that there was proper cleansing before injection. What occasionally does occur following an injection of too much fluid is a sterile slough.

PICRIC ACID JAUNDICE.

Since the outbreak of war the consumption of picric acid, with the intention of imitating jaundice and so escaping military service, has attracted a good deal of attention. Epidemics of this spurious jaundice have been described, and the medical journals, especially in France, have contained a number of articles on the subject, the first as long ago as 1914 by Garnier, Vannier, and Roussille. Marie contributed an excellent critical review last year, and quite recently Malmjac and Lioust, from an examination of the urines of 1029 cases of real or simulated jaundice, have isolated 129 cases of picric acid jaundice. Five, ten, or fifteen grains of picric acid taken internally in one, two, or three doses irritate the alimentary canal, causing vomiting and diarrhea, and turn the urine pomegranate-red; much of the picric acid is removed by vomiting and in the loose stools, but there is always enough to stain the skin and conjunctivæ yellow, the blood serum being yellow, instead of green as in ordinary jaundice, and the cerebrospinal fluid also yellow.

Some discussion has taken place as to the excretion in the urine, which begins three hours after the acid is taken; Malmjac and Lioust state that for the first twenty-four hours picric acid is found in the urine, and that after this its animoderivative picramic acid (dinitro-aminophenol) appears, and that its amount, relative to that of picric acid, progressively increases, the urinary excretion of the acids continuing on an average for twenty but sometimes for as long as thirty or even forty days. They also state that the skin of the head excretes picric acid only, while from the surface of the abdomen, armpits, and groins both picric and picramic acid can be obtained. Except for the initial gastrointestinal symptoms and the pigmentation of the skin and mucous surfaces there may be no symptoms at all; but in susceptible persons and after large doses the cells of the liver may be affected and bile may appear in the blood serum and in the urine, so that there is a true jaundice due to picric acid; this is likely to occur about the eighth to the ninth day after the picric acid is taken.

Among their 129 cases Malmjac and Lioust found urobilin present in 35 per cent, bile acids in 27 per cent, bile pigment alone in 7 per cent, and both bile acids and pigment in 17 per cent. The presence of bile in the urine does not interfere with the chemical detection of picric and picramic acids. The presence of these acids makes it highly probable that the acid has been taken by the mouth, for observations appear to show that workers in munition factories do not absorb enough picric acid to allow of its detection in the urine.

Pauly, however, published a case of acute yellow atrophy of the liver in a female munition worker, and, by a process of exclusion of other causes, ascribed it to the toxic effects of melinite, which contains picric acid, but the urine was not examined for picric or picramic acid. The liver weighed 21 ounces. In ordinary obstructive jaundice bile appears in the urine from the onset in considerable quantities, whereas when bile is found in the urine of persons who have swallowed picric acid, it is not until after a week's interval that bile, and then in relatively small quantities, is detected in the urine.—*British Medical Journal,* July 27, 1918.

MIDDLE-EAR SUPPURATION.

KEELER in the *Pennsylvania Medical Journal* for September, 1918, advises that in the treatment of acute suppurative otitis media it is of supreme importance for the patient to rest in bed during the acute inflammatory stage and until the danger of complications has lessened. A brisk cathartic "calomel" should be given.

In the early stage of a mild form accompanied by moderate pain, douching the external auditory canal with hot saline solution 105° F. will afford relief. When the pain is severe and occurs in paroxysms, moderate doses of opiates may be given to aid in tiding the patient over the period of excruciating pain.

The instillation of oily preparations into the auditory canal for relief of pain should be condemned. They have no therapeutic value and form a medium for the development of bacteria. Leeching, too, is to be condemned because it is unsanitary and presents grave danger of transmitting serious infection.

The drum membrane may be anesthetized by applying a solution of equal parts of menthol, cocaine, and phenol. Saturate a pledget of cotton with this mixture and carefully place in apposition with the inflamed bulging drum. In ten minutes the tampon is removed, the membrane incised, the inflammatory exudate is drawn from the tympanum by means of a mild suction pump, the auditory canal is irrigated with one of the antiseptic solutions, and a piece of plain sterilized gauze placed in the canal to facilitate drainage. General anesthesia can be used if preferred.

By this procedure pain is alleviated, and the danger of extension of the inflammation is removed. The subsequent healing takes place with no scar tissue. Spontaneous rupture should be avoided if possible, as the opening is small and jagged, with inefficient drainage, or the opening may be a large laceration, with borders more or less necrosed. Also the healing process is protracted, and scars with considerable deposit of new connective tissue in the drum membrane, or often serious damage to the delicate mechanism of the middle and internal ear, take place.

Myringotomy under strict asepsis is employed to evacute the tympanum of its purulent content, to relieve pain, to limit the extent of infection, to shorten the course of the disease, and to prevent complications. When the phenomena which indicate a retention of pus in the tympanic cavity are observed a clean-cut incision into the drum should be made as early as possible at the most prominent point and free drainage established.

TREATMENT OF MALARIA.

In the *Indian Medical Gazette* for August, 1918, Ross, the great investigator of malarial infection, makes a report in part as follows:

"I have recently received a very interesting document from the D. M. S., Salonika, giving the results of inquiries on the treatment of malaria which he has made among a large number of medical officers serving there, all of whom have constantly been treating malaria cases and supervising quinine prophylaxis.

"Apparently the best treatment for old cases of malaria which has yet been in use in the Southern, Eastern and Aldershot Commands, and London District (at least to judge by the small number of cases which are known to have relapsed after the treatment was given), has been devised by Harrison, in charge of the malaria cases at the Connaught Hospital, Aldershot. This treatment was used by him between the 10th of July and the 16th of October, 1917, for 49 chronic cases of malaria, mostly of benign tertian, and mostly arrived from Salonika. Of these, only 5 had relapsed after the cessation of treatment in October until the end of February, 1918, when I inspected a large number of cases. It may be added that three-fourths of these cases have been examined since their original treatment at the Connaught Hospital once a week as regards their clinical condition, their blood, and their weight; and as most cases of malaria in the Aldershot Command are closely in touch with the Connaught Hospital I think that the number of cases which relapsed (given above) is accurate. The percentage of cases relapsing as given by these figures is therefore only 10.2. The time which elapsed between the end of the treatment and the beginning of the relapse (in the 5 cases which did relapse) varied from 16 to 72 days, and averaged 34.5 days. Captain

Harrison reports that with this treatment the fever was reduced within from twelve to twenty-four hours, and that no asexual parasites could be found after forty-eight hours. The effect of the treatment as regards general improvement of health was good. The treatment was well borne by the patients, except for deafness and tinnitus, and there was very little vomiting; but the patients always object to stopping in bed for 12 days.

"The treatment was as follows: The patient is put to bed for 12 days and given daily the following treatment for all this period, namely, grains 15 of the bihydrochloride of quinine intramuscularly in each deltoid muscle, together with grains 10 of hydrochloride of quinine in mistura anticachexia No. 1, thrice daily—totaling 60 grains of quinine daily for the 12 days. After this the patient is allowed up and is given mistura anticachexia No. 2 four times a day—that is, 60 grains of quinine daily by the mouth, this treatment being continued for three days. After this the patient is given mistura anticachexia No. 3 four times daily for 14 days—that is, 20 grains of quinine daily, the patient being allowed to do light work all this time. Harrison's prescriptions for mistura anticachexia No. 1, No. 2, and No. 3, are appended below."

CONNAUGHT HOSPITAL, ALDERSHOT.

FOR THE TREATMENT OF MALARIA.

Mistura Anticachexia No. 1.

Quinine hydrochlorid	gr. x.
Tinct. ferr. perchlorid	m. v.
Liq. strychnia B. P.	m. v.
Liq. arsenic. hydrochlor.	m. v.
Acid nitrohydrochloric dil.	m. v.
Magnes. sulphat.	dr. ss.
Syrup tolu	dr. ss.
Glycerin	m. x.
Aqua, ad	oz. 1.

Sig.: For a dose; to be given, as directed, after food.

Mistura Anticachexia No. 2.

As No. 1, but add—

Quinine hydrochlorid	gr. v.
Acid nitrohydrochloric dil.	m. v.

To the dose.

Mistura Anticachexia No. 3.

As No. 1, but reduce—

Quinine hydrochlorid	gr. v.
Acid nitrohydrochloric dil.	m. v.

In each dose.

INFLUENZA.

The epidemic of influenza, which was here in mild degree in the early spring, has made the round of Europe and has returned to us in apparently somewhat aggravated form. There can be little doubt that it is genuine pandemic influenza, the same disease that prevailed so extensively in 1889 and subsequent years. Numerous reports have been given out that investigators had failed to find Pfeiffer's bacillus, but others again have found it. In Switzerland, which was sorely afflicted during the past summer, Professor Staehelin of Basle asserts that a study of the cases seen at the City Hospital there *(Correspondenz-Blatt für Schweizer Aerzte,* Aug. 10, 1908) showed beyond doubt that the disease was true influenza, due to Pfeiffer's bacillus. The latter was found in the sputum and cultivated from the blood, just as it was twenty-six years ago. The clinical course was precisely the same, but instead of being milder than the ancient epidemic it was decidedly more malignant. The mortality was relatively high, for 50 per cent of the populace were attacked and the total mortality during the epidemic was one per cent, due largely to pneumonia of influenzal origin.

There was a high morbidity from pneumonia among young adults which was less in evidence in the former visitation. Naturally in the great majority of cases the symptoms were those of uncomplicated influenza, chiefly fever, and the number of hospital admissions was very small, the patients being seen only when pneumonia had developed. The nervous and gastroenteric forms have been inconspicuous. Between June 16 and July 28 no less than 309 cases of pneumonia were admitted to the City Hospital, and of this number 46 died—about 15 per cent. As a rule the pneumonic complication set in slowly, heralded by a further rise of temperature, or, in other cases, by a peculiar cyanosis. The rusty sputum was absent and replaced by purulent matter, and autopsies showed that the condition was not typical lobar pneumonia, but lobular or pseudolobar in character. The pleura was usually involved to some

extent. The dangerous feature in these cases was the bilateral location, although in many patients the spread of the disease in the lungs was very limited. The fatal element was bound up directly with the amount of lung tissue involved. Very significant in this epidemic was the presence of an undoubted leucopenia which has a prognostic value.

But little comfort is held out by the author on the score of treatment, for he says the passage of a quarter of a century has brought no new remedy to light, and salvarsan, quinine, synthetics, and collargol were without influence on the disease. The most effective treatment, recalling the experience of the 1889-92 epidemic, consists in confinement to the house—to the bed if fever is present or the heart shows signs of weakness, a restricted but nourishing diet, and the administration of large doses of some salicylic preparation, preferably salicin. In the nineteenth century epidemic much harm was done by the indiscriminate use of antipyrin in overlarge doses, though an occasional dose of that, of phenacetine, or of salipyrine, may be called for.—*Medical Record*, Sept. 21, 1918.

PROPHYLAXIS OF MALARIA.

Rogers of Calcutta reaches these conclusions in the *Indian Medical Gazette* for July, 1918:

1. In places where the great majority of the inhabitants are already infected with malaria, as shown by a very high endemic index, quinine prophylaxis has little scope except in the case of European and other immigrants, among whom it is of the utmost importance, but for the general population *full curative treatments with quinine preferably once a quarter are necessary to materially reduce malaria.*

2. Quinine prophylaxis to be successful should be based on the following principles: (*a*) A sufficient dose should be given to kill all the invading parasites, so as to avoid the danger of any quinine-resisting form surviving and making the fever more difficult to cure. For this purpose not less than 10-grain doses are indicated: (*b*) The intervals between the doses should not exceed two days less than the mean incubation period of the most rapidly developing form of malaria present, which will almost invariably be the malignant tertian variety with a mean incubation period of six days and a minimum of two days. The interval should therefore not be less than four days, and if an epidemic is present this should be reduced to two days: (*c*) The prophylactic doses should be given *on two consecutive days* as a rule so as to act on the stage most amenable to quinine of each brood of a double infection.

3. The causes of the frequently reported failures of the two most commonly employed methods are: (*a*) in the case of Koch's bi-weekly doses on two consecutive days with a five-day interval, that the interval is too long in the case of malignant tertian malaria, especially when of a virulent form: (*b*) in the case of daily 5-grain doses, that the dose is too small to be certain to destroy all the parasites.

4. To be effective as a prophylactic against malaria, quinine should be given in not less than 10-grain doses on two consecutive days, with an interval of not more than four days without the drug, and in highly malarious places the interval should be reduced to two days and the dose increased to 15 grains. Ten grains every other day has also proved successful in Gill's hands.

TREATMENT OF ECLAMPSIA.

Arnold, in *American Medicine* for August, 1918, discusses this well-worn but always interesting subject. He thinks the best general plan for the treatment of eclampsia at the present time is about as follows:

1. Morphine, for the temporary control of the convulsions, half a grain or more at a dose, and repeated as soon and as often as necessary.

2. Bloodletting, as early in the attack as possible, and to the extent of from fifteen to thirty ounces, or more, according to the case and to the effect on blood-pressure.

3. Cleansing of the lower bowel, and giving, by Murphy drip, sodium bromide, one or two drachms, and sodium carbonate, two or three drachms, to the quart of normal salt solution, as rapidly and as constantly as the bowel will take it.

4. The darkening of the room, and the securing of quiet and freedom from all unnecessary disturbances, until the convulsions have been brought well under control.

5. The induction of labor in all cases occurring before the eighth month, if the convulsions have been at all severe in type, or more than three or four in number. After the eighth month the termination of pregnancy regardless of the number of convulsions, letting the circumstances and conditions determine whether the delivery shall be by the normal route, following spontaneous or induced labor, or by the more rapid method of Cæsarian section.

6. No food of any kind by mouth, until at least three days after convulsions have ceased, but a continuation of alkali-salt solution by bowel, or of alkaline water and salines by mouth, until the quantity and quality of urine are satisfactory.

It will be noted that this treatment programme has no place for chloroform, which is not only useless but extremely dangerous in eclampsia. It also bars, so far as possible, all peripheral or other excitants, such as gastric lavage, violent purging, hot packs (or other methods of sweating), and accouchement forcé. If, after controlling the convulsions, pregnancy is to be terminated, it must be done by whatever method promises least shock to the patient, and this precludes accouchement forcé.

The only immediate means of elimination, and of reducing blood-pressure, is by venesection, which is done early and in quantity to be effective, and may be repeated if necessary. Veratrum viride or other substitutes for bloodletting are not to be considered, so far as promptness and efficiency of action are concerned. The hot pack or cabinet sweat might not greatly disturb the patient, but those of us who more or less closely follow the Stroganoff idea believe that sweating is usually contraindicated, on the ground that the toxins are already too highly concentrated, and sweating only increases this concentration, by removing much water from the tissues without any appreciable quantity of toxins. Washing out the stomach cannot be successfully accomplished without greatly disturbing the patient at a time when the aim should be to prevent all disturbance. Purging is much slower than bloodletting, and can only remove the gastrointestinal poisons, and not the specific blood-borne toxins of pregnancy. This also would disturb the patient at a time when absolute quiet is most desirable. The giving of purgatives, therefore, can well be left for the secondary treatment when the convulsions have ceased to be the danger factor.

APOTHESINE AND ADRENALIN FOR REMOVING THE TONSILS.

COLEMAN reports his use of this combination in the *Medical Record* of September 7, 1918:

It is not the purpose of this necessarily brief report to go into the intricacies of synthetic chemistry. Apothesine is the name given to the hydrochloride of gamma-diethyl-amino-propyl cinnamate. It depends for its anesthetic qualities upon the esterification of an alcohol by an organic acid. The principal groups in its structural formula are the radicles of propyl alcohol and cinnamic acid.

Technique.—No new instruments are required for this work. A 2-Cc. hypodermic syringe with needle 3½ inches long, slightly curved at the tip, was used in these cases. The patient is given a hypodermic of morphine, grain ¼, with atropine, grain 1/120, about twenty minutes before the operation. About ten minutes after the hypodermic the anterior pillars of the fauces, the uvula, and the posterior pharyngeal wall are brushed with a cotton-tipped applicator moistened in 10-per-cent cocaine solution. This is repeated three or four times until the patient ceases to gag from the application. We are now ready to infiltrate the anterior and posterior pillars

with the anesthetic solution, which should be freshly prepared by dissolving three tablets in ninety minims of saline solution and bringing the solution to a boil. This anesthetic apparently can be boiled without deterioration. The first point of injection is at the uppermost part of the anterior pillar, and care must be taken not to insert the needle too deeply or the fluid will run out. The needle is inserted in such a way that it can be readily seen through the translucent membrane, and in this position about five drops, or enough to form a good-sized bleb, are injected. Injection is then continued downward, and each succeeding insertion of the needle is made within the bleb last formed. One of the important points for injection is the lowest part of the anterior pillar where it joins the base of the tongue. If this region is not thoroughly desensitized, intense pain will be caused by cutting through with the snare wire. The anterior pillar being thoroughly injected, we now carry out the same procedure in the posterior pillar, except with the latter, being shorter and more difficult to inject, two injections will suffice. Both sides are injected before the operation is begun. It is unnecessary to inject into the tonsils.

In all cases desensitized in this manner inquiry was made at each step of the operation to find out if the patient had any pain, and invariably the reply was that nothing could be felt. Enucleation can begin as soon as the injection is complete, because anesthesia is immediate, and there is no occasion for waiting as when cocaine is used.

The technique of operation does not differ from that used by other operators with cocaine anesthesia. In children, for obvious reasons, the use of general anesthesia is advised. It is remarkable how little these cases bled both during and after operation, and how little postoperative shock any suffered. The amount of inflammatory reaction was slight and healing rapid. Anesthesia seems to last about one and a half to two hours.

These operations were all done in a sitting posture. Since there is no danger of toxicity, it is well to distend the pillars with the apothesine-adrenalin solution. In each of Coleman's ten cases the entire quantity made up (ninety minims) was injected. Six of the patients were women. The youngest was a girl of sixteen.

Summary.—1. The apothesine solution can be freshly prepared and easily sterilized without deterioration.

2. It does not produce sloughing although considerable tension is made in the tissues.

3. The solution may be used in any reasonable quantity, no toxic effect being observed after the use of five ounces.

4. With proper care in the technique of infiltration the operation can be performed without the slightest pain.

5. Reaction is slight, and most patients are able to take food in a day or two.

PROGNOSIS AND TREATMENT IN EXOPHTHALMIC GOITRE.

To the *American Journal of the Medical Sciences* for September, 1918, STANTON contributes a safe and sane paper and concludes as follows:

Removal of a portion of the thyroid gland of patients suffering from exophthalmic goitre produces a profound immediate effect noticeable within a few days of the operation, and characterized chiefly by an improvement in the subjective symptoms of discomfort felt by the patient, but also accompanied by a marked fall in the pulse-rate, a diminution of the tremor, and an increase in weight.

This initial improvement, however, seldom amounts to a cure. The exophthalmos usually persists for months or years. The heart remains irritable, the pulse becoming rapid with exertion or excitement, and at irregular periods we may expect acute exacerbations of toxic symptoms, which may alarm both the patient and the surgeon.

The general tendency is, however, toward improvement rather than recurrence, and after a variable length of time a few patients may have failed to improve or even have grown worse; but the great majority,

Stanton believes about 80 per cent, will have continued to improve, so that finally practically all traces of their former trouble disappear.

It is useless for the surgeon to claim that there is no medical side to the treatment of exophthalmic goitre. After five or six years there is probably little to choose from between the medical and surgical end-results as regards either the mortality or the condition of the surviving patients.

Patients surviving operation have been promptly relieved of the more distressing subjective symptoms, and the majority of them will have been able to return to their normal work in about half the time that it would have taken them to reach the same state of improvement under medical treatment. Against this is the primary mortality which must always accompany operations for exophthalmic goitre unless we are to deny the chance of operative relief to many cases most in need of the relief.

In the future the man best able to treat exophthalmic goitre will be the one who has developed the judgment necessary to enable him to select the treatment, medical or surgical, best adapted to the individual case. The decision will depend upon many factors, not the least of which will have to do with the social condition of the patient, and whether she or he can afford the time and expense necessary for the prolonged rest required to effect a medical cure.

THE LONGITUDINAL SINUS FOR TRANSFUSION IN INFANTS.

FISCHER in the *Medical Record* of September 1, 1918, strongly advocates this procedure, pointing out that when we consider the difficulty encountered in trying to enter a vein the size of the median basilic or even the femoral in infancy, and compare the ease with which we enter the sinus located at the posterior aspect of the anterior fontanel, our choice will readily fall in favor of the sinus route. The method is so simple that even an inexperienced operator need not hesitate to try it.

By the use of the longitudinal sinus we have a direct channel through which a small or large quantity of blood can rapidly be taken from, or added to, the circulation. Since time counts for a great deal in depleted and marasmic infants, the simpler the route, the more advantageous to the infant.

Many obscure conditions exist in which intestinal intoxication and faulty metabolism of the food elements is diagnosed. Before a positive diagnosis can be made, if a luetic basis is suspected a Wassermann or Noguchi reaction may be required.

The shock incident to the exposure of a vein and the loss of time encountered thereby are factors which one must bear in mind when an easier, safer, and more rapid method offers itself. The risk of infection, if one exposed the jugular, femoral, or median basilic vein, must not be overlooked, especially in the weakened and puny infant. The median basilic vein is at times so small that it looks, in the case of an infant one month old, like a very fine white cord.

This sinus is also adapted for the abstraction of blood, as in venesection during convulsions. The relief afforded by this means is rapid and the operation does not produce shock. Intracranial pressure can be relieved quickly, and this method of local depletion serves as well as a lumbar puncture. This route is also adapted for procuring sufficient blood in the most rapid manner for blood culture. This point should be noted in suspected sinus thrombosis or malignant endocarditis. It is the most convenient place to give salvarsan injections. In septic diphtheria, where rapidity of action is necessary to bring the antitoxin into the circulation, the sinus route is indicated.

In hemophilia we have a hereditary or congenital disease in which bleeding may be interstitial or synovial, external, spontaneous, or traumatic. The coagulation time is usually delayed. Peterson reports six transfused cases of hemophilia, one of these through the sinus route, with excellent results.

As a hemostatic, human blood acts in many instances rapidly—almost specifically.

In a hemophiliac infant, following circumcision, two ounces of blood injected into the longitudinal sinus checked the hemorrhage within twenty minutes, although the infant had bled for four hours prior to this treatment. In another case of continued hemorrhage following an excision of cervical glands, postoperative treatment was unavailing until one ounce of human blood was injected by the sinus route.

Normal saline solution and sterile serums may be injected during or following atrophic conditions due to enterocolitis. By this means the column of blood can be replaced and a marked stimulus added to cardiac weakness. Such injections may be repeated once in twenty-four hours without producing shock. The first injection of 100 Cc. may be followed by one of 150 Cc., and later 250 Cc. may be injected every twenty-four hours until good stimulation is produced.

The sinus route is well adapted for the injection of sodium bicarbonate solution in cases of acidosis. Dextrose solution may also be injected by this method.

Technique.—The infant should be wrapped in a mummy bandage, well pinned so that the arms and legs are confined, and placed flat on its back on a table. The head should be steadied on both sides by an assistant while the needle is inserted into the sinus. As a rule the sinus can be entered through the anterior fontanel up to the end of the second year. Anatomically the sinus does not vary. It grows wider toward the back of the head, hence we should always utilize a point as far posteriorly as possible. As the needle is pushed through the posterior angle of the fontanel it should be directed downward and backward in line with the sagittal suture. The landmarks are positive, and with but little practice we cannot fail to enter the sinus. As the sinus lies very superficial we need not go deeper than 1 or 2 mm. For this purpose a needle one-half inch long of a 20- or 22-gauge, with a sharp point, is best adapted. For withdrawing blood a Luer or Record syringe should be attached. As the needle penetrates the sinus resistance is lessened, and we encounter the same sensation which we feel when the needle enters the dura in doing a lumbar puncture.

EMPYEMA.

McKENNA reports on the plan of treating empyema at Camp Pike as follows in the *Journal of the American Medical Association* of August 31, 1918:

Twenty-five patients have been operated on since April 1, with one death, and the prognosis for the recovery of those remaining is excellent. In the fatal case the patient was operated on according to the old plan of costectomy. Mention is made of this fact, as in none of the nineteen cases reported in this group in which operation has been performed by the new plan have any patients died. In addition to the treatment outlined in the March 22 report he has made one change, which is referred to in the previous sentence as the "new plan." To this type of operation McKenna wishes to direct especial attention, namely, the draining of the pleural cavity, irrespective of the character of the pus, by means of a No. 14 French rubber catheter, introduced by means of a trocar and cannula, just large enough to thread the catheter into the pleural cavity.

The catheter is then connected with a 100-Cc. glass syringe, and aspiration is intelligently and carefully carried out. If the pus is too thick for aspiration, a small amount of neutral solution of chlorinated soda (Dakin's solution) is allowed to run in. This solution quickly liquefies the pus, so that by repetition of this procedure the entire cavity is emptied. The cannula is withdrawn, leaving the catheter in place, and one-half the number of cubic centimeters of Dakin's solution are allowed to run into and remain in the pleural cavity as correspond to the quantity of pus aspirated during the operation. The process of aspirating through this catheter and the instillation of Dakin's solution is repeated by a trained ward surgeon three times a day and two times during the night by an especially trained nurse. When by

examination, either by the Roentgen ray or by aspiration, separate pockets of pus are found to exist, this same procedure is followed.

The last nineteen patients in this group have been treated by this method, and McKenna is firmly convinced that this plan of procedure is a marked improvement over any type of operation that has been performed in his experience.

[This method of treating empyema has been practiced for many years, except so far as Dakin's solution is concerned.—ED.]

PROPHYLAXIS OF MALARIA.

In the *Journal of the Royal Army Medical Corps* for July, 1918, RAWNSLEY, CUNNINGHAM, and WARNOCH make a report on this subject and give these possibilities of the standard quinine treatment:

1. No deafness, visual defects, or other disadvantages are likely to accompany or follow the administration of quinine thirty grains daily for three to four weeks.

2. The general health and physical fitness of malarial cases so treated will markedly improve under treatment.

3. Arsenic is a valuable adjunct to quinine in the treatment of malaria.

4. Few relapses are likely to occur and fresh infections can be dealt with as they arise (no relapse, excluding one uncured resistant case, occurred amongst the special series treated, after four weeks of very severe weather since cessation of the treatment).

5. The malignant tertian parasite would appear to be the most resistant type. Relapse cases occurring in the early months of the year are generally benign tertian; it is probable, therefore, that a three to four weeks' course of thirty grains daily will cure a considerable proportion of the men so treated.

6. A possible difference in the parasite found in this country from that seen elsewhere has been often mentioned. It would seem probable, however, that the different effects produced may be due to indefinite and irregular quinine administration.

THE ADRENALIN TEST FOR BASEDOW'S DISEASE.

In the *Journal of the American Medical Association* of August 3, 1918, JONES reminds us of this test, sometimes called that of Goetsch. If a person has overactivity of the thyroid, and 0.5 Cc. of the standard 1:1000 solution of adrenalin be injected, she will exhibit a much more marked reaction than will a normal person. Blood-pressure, respiration, etc., having been noted when the patient is tranquil before the injection is made, it will be discovered that as compared with these preliminary readings there will be an elevation of blood-pressure or pulse, or both, of ten points or more after the injection. The objective and subjective findings, such as increased tremor, coldness of hands and feet, throbbing, some apprehension, etc., are brought out quite perceptibly. The degree to which these phenomena attain will be governed by the degree of hyperthyroidism. Taken altogether, the injection of adrenalin will induce an exacerbation of a typical real hyperthyroid syndrome, the attack thus precipitated lasting perhaps an hour and a half.

DIABETES INSIPIDUS RELIEVED BY PITUITRIN.

CLAUSEN, in the *American Journal of Diseases of Children* for September, 1918, makes the following remarks:

1. Study was made of the urinary output of a 9½-year-old boy suffering from diabetes insipidus, as influenced by injections of pituitrin.

2. Following injections of from 0.25 to 1 Cc. of surgical pituitrin, there is a marked diminution of the urine volume.

3. This diminution persists for from five to six hours, sometimes much longer.

4. The volume of night urine is reduced when pituitrin is injected at any time on the preceding day.

5. The hourly rate of elimination of chloride is always reduced after injection of pituitary solution.

6. The hourly rate of elimination of urea

is usually only slightly, if at all, reduced by injection of pituitary solution.

7. The hourly rates of elimination of creatinin and uric acid are only slightly reduced by injection of pituitary solution.

8. The hourly rate of elimination of titratable acids in the urine is only slightly influenced by these injections.

9. The hourly rate of elimination of no substance studied is increased by injections of pituitary solution.

10. When the hourly ingestion of water and sodium chloride or urea is maintained at a constant high level, the urea elimination is quite uninfluenced by the injection of pituitary solution, whereas the chloride elimination is considerably diminished, and the water elimination very much diminished.

11. Pituitrin injections in diabetes insipidus control urine output primarily and thirst secondarily.

ENLARGED THYROID.

C. H. MAYO, in the *Journal of the American Medical Association* of August 31, 1918, states that Plummer, in the observation of many thousands of cases of goitre, numerous cases of cretins and of myxedematous patients, has shown that the rate at which energy is produced by the animal organism is controlled by the amount of thyroxin which is acting within the cells of that body. While not the only factor influencing the rate at which we live, it probably has more to do than any other substances with the governing of the speed at which energy is produced in the body. Plummer shows the average basal metabolic rate of exophthalmic goitre patients at the time of coming under observation to be 57 per cent above normal, and the average rate in those in whom ligations were done, and who returned in three months, to be plus 39 per cent. The average rate eighteen days after thyroidectomy is plus 19. Ligation probably causes the metabolic rate to drop approximately 15 per cent.

Patients having adenomas of the thyroid also show variations in the output of the gland, the average rate on coming under observation being plus 39, and the average rate eighteen days after thyroidectomy slightly above normal. The average energy transformation for normal persons is approximately 39 calories to a square meter of body surface an hour. The basal metabolic rate of normal persons does not fluctuate more than 10 per cent above or below this average.

Plummer's observations show that the thyroid hormone (thyroxin) determines the rate of formation of a quantum of potential energy available for transformation on excitation of the cell. The total amount of thyroxin in the tissues of the body of normal persons is in all probability approximately 13 mg. Each increase of 0.033 mg. (approximate) of the thyroxin in the tissues of the body increases the rate of energy output 1 per cent. Other factors being constant, the total energy output of the body varies with the amount of thyroxin in the tissues and the rate of excitation.

The work of Plummer is of the utmost importance in showing the thyroid to be a most active factor in the metabolism of the individual. The metabolic rate is raised or lowered by the activity or non-activity of the thyroid and is measured by the amount of oxygen utilized from the air in respiration and the output of carbon dioxide in the expired air.

Exophthalmic goitre or gland hyperplasia and overactivity develop an enormous increase in the metabolic rate, running in cycles of recurrence above the basal metabolism from 16 to 100 per cent or more, according to the severity of the case. We thus have small exophthalmic goitres which are often more active in their effect than others which are evidently several times larger than normal. There is little or no deposit of colloid, as a rule, in the active cases, the colloid serving as a suspension agent for secretion, being deposited in the interior of vesicles when seen in simple goitres and as occasionally seen in areas of exophthalmic goitre. Therefore, we see that the energy output of the

gland may vary greatly and the development of the remaining lobe, or even of half a lobe, after operation or partial thyroidectomy may subsequently cause a metabolic rate of from 40 to 90 per cent above normal; this, however, rarely happens. It is difficult in some cases to tell the exact amount of gland it is necessary to remove in order to secure a drop in metabolism to nearly normal limits. Thus a few cases require a second, and a still smaller number a third operation. They are not the result of the failure of surgery to cure exophthalmic goitre, but are a still greater proof of the value of surgery in its cure. The removal of a larger portion of the gland accomplishes a cure depending on the activity of the individual gland, as the benefit of the operation is obtained through the reduction of secretion. Thyroid secretion will persist in the body for approximately eighteen days (Plummer). We are still lacking in the knowledge of the activating agent which causes hyperplasia, the discovery of which is undoubtedly impending.

RADIUM THERAPY IN HYPERTHYROIDISM.

In the *Canadian Practitioner* for August, 1918, AIKINS writes optimistically on this topic. He treated one or two cases of hyperthyroidism some seven or eight years ago with clinical improvement. The permanence of the result obtained in these patients justified one in advocating radium therapy for such functional disturbances of the thyroid. In all, forty-five cases have been under treatment, the majority during the past three years. Of these, twenty-three have been clinically cured—that is, the tachycardia, tremor, and restlessness have disappeared, and symptoms of excessive thyroid secretion have abated. In seventeen cases there has been an improvement, but not a complete cessation of symptoms. Four cases have passed from observation. In only nineteen patients did the thyroid gland itself decrease in size, as evidenced by neck measurement, while in six there was no diminution in the size of the gland, although the nervous symptoms were completely relieved. In three cases thyroidectomy had been performed, but the nervous symptoms had not diminshed. This was, however, effected by radium therapy.

In connection with the treatment of these cases, it must not be overlooked that general medical measures were carried out as well. In some cases complete bodily and mental rest, in others partial, was established. A low protein diet and one poor in extractives was advised, while the internal administration of quinine hydrobromate, grs. 5, t.i.d., together with ergotin, gr. 1, t.i.d., was prescribed. In a large number of the cases all these usual medical measures had failed to relieve the symptoms, and it was only when radium therapy was added as a therapeutic measure that the hyperthyroidism was lessened.

It is to be noted also that it was only in a percentage of cases that there was decrease in the size of the gland. Surgical measures would be necessary in many to effect this, and yet the nervous condition was such that surgery was a very risky procedure. The relief of the nervous symptoms made it possible to undertake the surgical removal of the goitre for cosmetic reasons later on if the patient wished it.

TREATMENT IN THE TOXEMIAS OF PREGNANCY.

STRACHAN, in the *British Medical Journal* of August 3, 1918, writes entertainingly on this always interesting topic. He says that, as regards diet, it may be necessary to withhold nourishment of any sort for a day or two, but usually rectal alimentation will be borne quite satisfactorily. The mere peptonizing of milk can hardly now be considered a sufficient procedure. Short and Bywaters have pointed out, as the result of experiment, that proteins must be broken up, not merely to the peptone stage, but must be completely hydrolyzed to the amino-acid state before they can be absorbed by the bowel mucous membrane. Prolonged action of the enzyme powder is

therefore necessary. The same observers find glucose well absorbed by the rectum and colon, but not so other food radicles.

These considerations are important when we remember how essential is nourishment to such patients, and how quickly they emaciate; they may, indeed, in a very short time, sink so low as to be beyond any treatment.

In this condition we must always from the very first, and no matter how the case may be, keep induction of labor in mind; the tendency is too often to leave it until every palliative drug and method has been found wanting, by which time the patient is often fatally ill, and the death is regarded as the result of the operation, where it is due really to the failure to operate at the proper time.

Of drugs, the gastric sedatives—bismuth carbonate, tincture of opium, dilute hydrocyanic acid—have a most variable action; in some cases they are apparently without effect, while in others their action is quite magical; often, however, they appear merely to excite further vomiting. We cannot look to drugs for any real help in this disease. In his experience the gastric sedative most likely to prove effective is dilute hydrocyanic acid in 5-minim doses three times a day.

In all toxemias elimination of fluids so as to remove the circulating toxins is safe and rational treatment.

Strachan has referred to the washing out of stomach and bowel which should be done in every case of toxemia in pregnancy; of purgatives (when they can be retained in hyperemesis) the hydragogues—magnesium sulphate 60 grains daily, or compound jalap powder 90 grains as required—are good, but for the reasons stated above we must rely mainly on enemata. In an unconscious eclamptic patient croton oil would suggest itself. He has tried it several times, but has found it unsatisfactory and useless. Jardine reports a case in which edema glottidis followed its exhibition, and he is much opposed to its use.

Diaphoresis the author has found of distinct benefit, and he has never seen the extreme collapse described by Tweedy. The hot pack, or, when it can be obtained, the hot air bath, are both quite safe if the pulse be carefully watched. Pilocarpine he has never dared to use, on account of its lowering and reducing action.

As the toxins are circulating in the blood, it is reasonable to suppose that by bloodletting a certain amount of toxin will be removed, and that if in addition fluid (for example, saline) be introduced in place of the abstracted blood, the remaining toxins will be diluted, while the kidneys will be washed clean of accumulated metabolic débris and stimulated to normal excretion.

All these hopes have been realized in practice, and this line of treatment has been of much value. Jardine, the foremost in this country in this direction, at first used sodium acetate, 40 grains to the pint of water, the solution being at a temperature of 104 degrees Fahrenheit. He selected this salt on account of its diuretic action, but he and others now use normal saline, and with equally good results.

Where venesection has been performed (15 to 20 fluid ounces may safely be removed in a case of average severity) saline, two to three pints, may be introduced into the vein at the same operation, and it will be found that the distended veins in eclampsia facilitate this procedure; very different is the case with the collapsed veins which accompany the severe prostration of hyperemesis.

In the less urgent cases the saline may be administered by the rectum, and with admirable results; saline may thus be administered continuously. Generalized edema is usually held to be a contraindication to transfusion, but in practice he has not found it so; however, if edema of the lungs be present, as evidenced by the presence of dulness and râles at the bases, it is better to withhold saline, as this edema may become aggravated and the patient be literally drowned in her own mucus.

The sudden and very temporary elevation of temperature sometimes seen after transfusion is usually of no moment practically; it has been attributed to the fluid used being

at too high a temperature, but this explanation is quite insufficient to account for the great majority of cases.

Renal decapsulation, introduced by Edebohls and recommended also by De Bovis, Stoeckel, Sippel of Frankfurt, Lichtenstein of Leipzig, and others, the writer does not propose to consider at any length. It is a serious remedy; he has never found the need to employ it, and can hardly see any justification for such a procedure. The death-rate is bound always to be high, and the operation has, quite properly, never become popular.

It is founded on an entirely theoretical basis—to relieve congestion of the organ—and he can see no object in such a severe manipulation when the induction of labor is almost certain to have an infinitely more beneficial effect. Any value attaching to Sellheim's operation of amputation of the breasts—the supposed source of the causative toxin according to this observer—depends probably on the accompanying loss of blood, and cannot seriously be regarded as rational treatment.

The methods considered are all at least unsatisfactory. Mostly they are inefficient to cure. Emptying of the uterus, on the contrary, forms the bedrock of operative procedures in these toxemias.

In general terms, then, the safe and logical obstetrical rule is to treat toxemic cases of slight and moderate severity by these described palliative measures at first, but if no improvement shows within twenty-four hours, and much more if the condition become worse in spite of treatment, we must empty the uterus. When this line of treatment has been decided on the sooner the operation is proceeded with the better for the patient. We must entirely disregard the period of gestation and the question of fetal viability and consider only the interests of the mother. In severe cases the uterus should be emptied at once.

In pernicious vomiting Williams lays stress on the ammonia coefficient of the urine, and urges that cases with a low coefficient are almost always hysterical, and should be treated as such, and induction of labor not performed. This is true as a generalization, but it must not be forgotten that such cases by prolonged starvation may develop a high ammonia coefficient. Again, cases of purely hysterical vomiting may die of inanition, and in such cases, everything else failing, induction of labor will be called for purely as treatment for the neurosis. These exceptions to the above rule must always be kept in mind.

As regards eclampsia, Bumm quotes Seitz, who reports a death-rate of 6.5 per cent with early delivery, 17.2 per cent after later delivery, and 28.6 per cent with purely expectant treatment. Bumm himself found a death-rate of 30 per cent with expectant treatment, but since 1901 he has in every case delivered as soon as possible after the first fit, and now reports a mortality of 2 per cent—truly an altered figure.

These views are supported by Zweifel, Horn, Jardine, Cameron, Munro Kerr, and Williams. Hermann, Ballantyne, and especially Stroganoff of Petrograd, still advocate expectant treatment and quote figures to support their beliefs. From a recent observation of almost forty cases of eclampsia Strachan has no hesitation in recommending the emptying of the uterus after the first fit.

The method used will be governed by several factors, especially the urgency of the case and whether or no parturition is proceeding. In hyperemesis, which usually occurs long before term and not at parturition, the insertion of a bougie between membranes and uterine wall will usually be sufficient, the process being then completed normally and usually quite rapidly. If the cervix be tight or the process slow, moderate and intermittent cervical dilatation will usually answer.

In eclampsia at term parturition usually has set in and may be left to be completed, or if thought fit forceps may be applied to speed the process. But if forceps are used no undue force must be employed or unnecessary speed obtained, as a very severe perineal tear may result, which, as the patient is so likely to be a primipara, will very unfavorably influence her later ob-

stetrical and gynecological history. But if dilatation be slow (perhaps owing to a tight cervix) and the eclamptic condition is becoming worse, operative cervical dilatation is called for. It is wise to be very chary of sudden dilatation either by hand or by Harris's dilators; I have never failed to observe marked postoperative shock after these methods, and once I saw instant death during the procedure.

IS THE MODERN TREATMENT OF SYPHILIS A SUCCESS?

Most physicians who have been in practice twenty years or more can recall cases of syphilis treated with mercury and iodine via alimentary canal for the then recognized period of two to three years, and to-day can place the pateints, having had them under observation for that length of time, or being aware of their presence in the community, and can say that they have evidenced no outward or inward signs or symptoms of the disease. They can even recall sporadic cases in which the disease has appeared twice in the same patient, thus evidencing a cure for the first outbreak. Furthermore, they can bring to mind cases which have been quite thoroughly treated, but which, ten or more years later, have presented manifestations which point all too clearly to the activating syphilitic poison. Whether cases were completely cured or not, it is certain that the disease remained quiescent and did not give the patient any further trouble, often through a long life.

To-day the former treatment has given way to intravenous injections of one of the arsenical compounds, supplemented by the former treatment, or at least by hypodermic injections of some mercurial compound. Can the results achieved by this form of treatment be termed successful? Are we any better off with it than with the older treatment? And which is the remedy, the arsenical compound, or the mercury?

If the results achieved at the Toronto General Hospital can be taken as a criterion and on a par with those achieved in other similar institutions, the majority of physicians can hold to no other opinion than that the treatment is neither satisfactory nor encouraging, even though the writer we shall presently quote states: "Considering the class of cases that have been dealt with at our clinic, the results of treatment are not at all discouraging." This is an opinion of very doubtful value.

In the July issue of the *Canadian Medical Association Journal*, Dr. W. T. WILLIAMS outlines the method of treatment and the results obtained in five hundred cases. Of these five hundred cases, 145, or twenty-nine per cent, were at an early stage of the disease; 355, or seventy-one per cent, were at later stages. On an average of seven and a half doses of 0.5 gramme plus four and a half intramuscular injections of mercury, negative Wassermanns were secured in only seventy cases, approximately fifteen per cent. Of these seventy cases, twenty-three were in early stages of syphilis, and forty-seven in the later stages. "Practically all of the late cases were given in addition mixed treatment of mercury and potassium iodide." Very important, too, is this sentence: "Twenty-four cases had a return to positive Wassermann, thirty-five still remain negative, while eleven of them passed from our control"—a not uncommon sequence to the treatment of such cases. That is to say, of the series of five hundred cases treated, thirty-five cases, seven per cent, may be said to be cured, that is, so far as a Wassermann negation indicates a cure. The number is very, very small, and instead of being problematically "not discouraging," is to say the least, entirely so.

How can the conscientious physician face the patient who seeks a cure for this elusive enemy in his blood or his tissues, and tell him that at the Toronto General Hospital seven per cent of the cases are supposedly cured? Surely these results are humiliating rather than "not at all discouraging."

Nor can many be found to agree with a further statement that "about eighty per cent of all cases experienced relief or freedom from all symptoms, which at any rate is encouraging." Has it not been the comman experience that a majority of all cases

of syphilis experience relief or freedom from all symptoms either with or without the former treatment after the so-called secondary stage has been passed?

There is, however, another vital point in this modern treatment of a patient with syphilitic infection, the question of expense. Are physicians justified in placing this added financial burden upon patients, when they can probably secure satisfactory "cures" in seven per cent of the patients so treated?

The time now seems opportune for the national medical bodies of Canada and the United States (the Canadian Medical Association, and the American Medical Association) to consider the entire question of the modern treatment of syphilis by the intravenous method of arsenical preparations, to appoint commissions or committees, and to have the statistics of hospitals and those of private practitioners with sufficient experience along these lines collected and collated, so that the profession of medicine and the patients may become assured of any real value which this modern method of treatment possesses.—*New York Medical Journal*, August 17, 1918.

TREATMENT OF CEREBROSPINAL MENINGITIS.

HERRICH, in the *Journal of the American Medical Association* of August 24, 1918, gives the following plan of treatment:

The diagnosis having been established with the least possible delay, the attempt is made to sterilize the blood stream by massive doses of antimeningococcus serum introduced intravenously. The general plan of treatment is as follows: The patient is desensitized by the injection of 1 Cc. of serum subcutaneously. One hour later from 80 to 150 Cc. are given by vein, the first 15 Cc. at the rate of 1 Cc. per minute. The remainder is allowed to flow more rapidly. In the severe cases the injection of this volume of serum is repeated every eight to twelve hours, in the mild cases every twenty-four hours, until the symptoms are under control. The average number of intravenous injections given is four and a half, the average total amount of serum is 400 Cc. The greatest number of intravenous serum injections given in any case is twelve; the highest total amount of serum, 1050 Cc.

Does antimeningococcus serum sterilize the blood? That this desirable end is accomplished is shown by the results of blood cultures.

In all of the author's recent cases a blood culture has been made on admission before serum treatment was begun. Approximately one-third of such first cultures have been positive. A second culture has been made twenty-four hours later—after from one to three large intravenous injections have been given. In no case has this second culture been positive.

If the spinal fluid is clear there is no interference with the central nervous system. So soon as meningitis develops, lumbar puncture is performed about half an hour after the intravenous injection. Sufficient fluid is withdrawn to reduce the pressure to an approximate normal, and rarely more than 30 Cc. of serum are introduced into the spine. The average number of spinal punctures in the cases treated by this method is seven; the average number of intraspinal serum injections, four. The freest possible drainage is aimed at after the intravenous injection of serum. Since the permeability of the inflamed choroid plexus for antibody has been quite well established, it is believed that drainage at this time results in the introduction of a considerable amount of antibody from the blood into the cerebrospinal spaces. Satisfying proof of this is the prompt disappearance of meningococci from the spinal fluid when these massive intravenous injections are given. With infrequent exceptions the meningococci are not found after the first forty-eight hours. Under the older methods of treatment they were present for a longer time in the average patient.

The important points in intravenous serum treatment are given as follows:

1. It must be employed with boldness, yet with care. One must be prepared to give

from four to eight massive injections by vein of from 80 to 150 Cc. during the acute stages of the disease, or a period of from two to four days. There is much more danger in insufficient than in excessive intravenous serum administration. We have, in fact, in 128 cases so treated, had no serious serum effects. The writer regrets that serum was not more freely used in many of the early cases.

2. The desensitization by subcutaneous injection of 1 Cc. of serum one hour before the introduction of serum into the vein and the cautious injection of the first 15 Cc. at the rate of 1 Cc. per minute are the secrets of safe intravenous serum therapy. Immediate stopping of the injection with the appearance of dypsnea, pallor, cyanosis, vomiting, weak, rapid or irregular pulse or other immediate serum effects is essential. Renewal of the attempt after two or three hours is rarely unsuccessful. Even those patients thoroughly sensitized to serum by earlier courses of treatment can be treated safely with these precautions. It is desirable to give morphine and atropine before the injection, but they are not absolutely necessary. It is well to have these drugs at hand in case of dyspnea or other symptoms of discomfort following the treatment. Epinephrin also should be available.

3. A knowledge of when to stop treatment is important. Harm may result from too much as well as from too little treatment. Particularly is this true of intraspinal injections. The number of convalescents that show evidence of a subacute or chronic caudal myelitis in weakness, atrophy of muscle groups, local vasomotor disturbances, and exaggerated or otherwise altered reflexes of the lower extremities is sufficient to compel attention to the danger of too active interference with such a delicate and vulnerable structure as the cauda equina. One great advantage of intravenous treatment is that the number of intraspinal treatments is reduced. In two serious cases no serum was used intraspinally, drainage being carried out only by lumbar puncture, and reliance being placed on intravenous injections. Both patients recovered. We are, however, far from advising abandonment of intraspinal treatment. In fact, all our experience confirms its importance and effectiveness. The local treatment of meningococcus infections when foci are established in meninges, joints, pericardium or other accessible regions is most effective and must not be neglected by too great attention to the blood-stream invasion.

In those prolonged cases in which meningococci persist in the spinal fluid and in which the patients are made uncomfortable by intraspinal injections, showing increased opisthotonos, and severe pain in the head or back or lower extremities following the treatment, it is better to omit all interference.

At times drainage may be necessary with or without further intravenous injections. Many of these prolonged cases apparently become intolerant of intraspinal serum injections. If satisfactory response does not follow a series of eight or ten intraspinal treatments, it is generally best to cease injecting serum intraspinally, continuing drainage only if there is discomfort from increased intracranial pressure or apparent danger of blocking the foramina.

In relapsing cases the entire cycle of treatment must be repeated with the same thoroughness and care used in the initial course. The organism cultivated from the blood or spinal fluid may be used to determine the presence of agglutinins in the serum employed. Valuable evidence can thus be obtained as to the specificity of the serum for the strain of meningococcus present. This is of the highest importance. Therapeutic results seem to parallel the agglutinin content of the serum for the special strain of meningococcus involved. Commercial serums are frequently lacking in high agglutinin content, and their therapeutic effect is often disappointing. In the absence of desirable results from a given serum, use should promptly be made of serum from another source. This may be of vital moment to the patient. The standardization of serums by governmental authority is an urgent need.

4. Other more general methods of treatment are not to be neglected. Morphine is given without stint to disturbed patients during the first twenty-four or forty-eight hours to control violent symptoms. Large amounts are well tolerated. Chloral and bromide are likewise useful. Of great importance is an adequate supply of liquid. Patients will drink almost without limit, and despite this their tissues often seem to lack fluid. In some of these almost desiccated cases, First Lieut. Arthur M. Dannenberg, M. R. C., has suggested and successfully used intravenous injections of physiologic sodium chloride solution with or without sodium bicarbonate. Abundant food is required.

THE ROUTINE USE OF SPINAL ANALGESIA IN GYNECOLOGY.

The *Lancet* of August 3, 1918, refers editorially to a paper in its original columns as follows:

Spinal anesthesia has proved so useful in operations below the level of the umbilicus that it is not surprising to find gynecologists are using the method more and more. Up to the present time, so far as we are aware, this method of anesthesia has hardly been regarded as sufficiently free from risk to be employed as a routine procedure in all cases; but the series we publish, from the clinique of Professor Dobbin at the Kasr-el-Ainy Hospital, Cairo, proves that it can be used, at any rate in Egyptian women, in all varieties of gynecological operations with success and safety. A total of 1891 operations under spinal anesthesia is sufficient to warrant us in regarding as trustworthy such evidence of the advantages and disadvantages of spinal anesthesia in this class of case. From the conclusions drawn by Dr. Mahfouz—and the facts he adduces certainly warrant his conclusions—the advantages are many and the disadvantages few. The small number of cases in which complete or partial failure to produce analgesia occurred can almost all be explained as due to errors in technique, and the series is very remarkable for the infrequency with which dangerous symptoms occurred, either during or after the operation. The author remarks that the woman may find the lithotomy position distressing while she retains consciousness, but this is readily got over by putting the patient lightly under the influence of a general anesthetic before the intraspinal injection is given, and if necessary keeping her sufficiently under to prevent her being conscious of what is actually happening. The plan has already been adopted by some gynecologists. Very little general anesthetic is required when the patient is under the influence of stovaine, and it is quite easy to keep her sufficiently under its influence to annul entirely any mental shock consequent upon her exposure in the lithotomy position or upon the discomforts of the extreme Trendelenburg position. It is urged by some of its adherents that spinal anesthesia does away with the necessity for the Trendelenburg position; but this is not so. It is true that spinal anesthesia gives complete abdominal relaxation, but the facilities for carrying out such an operation as an extended abdominal hysterectomy afforded by the Trendelenburg position are so real that it is the custom of many gynecologists to invert their patients even when spinal anesthesia has been employed. Some operators elevate the table as soon as the spinal injection has been given; others—and this, in our opinion, is the best plan—wait some fifteen to twenty minutes before doing so. It is especially in such operations as extended abdominal hysterectomy for cancer of the cervix uteri that the combined method of spinal and general anesthesia is so useful. The performance of the operation is facilitated, the shock lessened, and the convalescence of the patients rendered quicker. Dr. Mahfouz's paper is a valuable contribution to our knowledge of spinal anesthesia, and Professor Dobbin's excellent results should do much to commend the method to gynecologists.

In the paper above referred to the author describes his technique as follows:

Stovaine billon was used in about half the cases. Each ampoule contained a little

over 2 Cc. of the following: Borate of epirenin, 0.00013; stovaine, 0.04; sod. chlor., 0.0022; distilled water to 1.00.

The amount injected is the same for a big or small operation—viz., 2 Cc. of the solution containing 0.08. In some cases we injected half or three-quarters of the dose, but the effect was not quite so good and passed off more quickly. As an exception we may mention colporrhaphies, in which half a dose is sufficient, but even there it is better to inject a full dose, as it may be found necessary to do something more.

More recently Mahfouz has used sod. chlor., 0.0011; stovaine, 0.04; water, 1 Cc. It is prepared as follows:

The sodium chloride is dissolved in the water. The solution is sterilized in the autoclave for fifteen minutes and then left to cool down. The stovaine is dissolved in solution and filtered through a good filter previously sterilized. It is then heated on a water-bath for ten minutes at 80° to 90° C. After cooling it is stored in sterilized ampoules. The whole process is carried on aseptically. Attempts to sterilize the stovaine solution by boiling have resulted in the decomposition of the stovaine and it is not necessary, stovaine itself being antiseptic.

THE TOXICITY OF EUCALYPTUS OIL AND MYRTOL IN HUMAN BEINGS AND IN ANIMALS.

Barker and Rowntree in the *Bulletin of the Johns Hopkins Hospital* for October, 1918, reach these conclusions:

1. Derivatives of plants belonging to the natural order *Myrtaceæ*, and especially oil of eucalyptus and myrtol, may in large doses cause profound intoxication. In certain persons there is an idiosyncrasy, the symptoms of intoxication occurring after minute or therapeutic doses.

2. The intoxication may affect chiefly the skin (myrtogenic dermatopathy); in some persons, nervous and cutaneous manifestations are simultaneously observable.

3. Recovery occurs in most instances, though several fatalities following eucalyptus poisoning have been reported.

4. The symptoms of intoxication of the nervous system observed in man can be reproduced in animals by subcutaneous and by intraperitoneal administration of myrtol.

"DON'TS" IN THE USE OF TUBERCULIN.

Roy, in the *Calcutta Medical Journal* for July, 1918, gives the following "don'ts:"

1. Don't use tuberculin in East Indians.

2. Don't use tuberculin until diagnosis is sufficiently confirmed.

3. Don't use it unless you obtain full control and confidence of the patient, and more so, of the friends and relations of the patient.

4. Don't begin its use until the fever is down.

5. Don't use it unless and until the technique is mastered.

6. Don't persist in tuberculin treatment if the patient's weight, appetite, and general well-being are not improved.

7. Don't neglect to attend to other details of treatment when giving the specific drug.

Conclusion.—Tuberculin, like most other specific drugs, can be useful or otherwise, according to the skill and knowledge brought to bear on its application; to that extent its use entails a personal factor. But when a fuller knowledge of how it acts and how it should be used is attained, a more general use of the drug will certainly reveal its specific value in the treatment of tuberculosis. Roy has yet to know of a case in which the drug, used with the precautions mentioned above, has done harm.

FATS IN THE DIET.

To the *British Medical Journal* of August 3, 1918, the eminent physiologist, Starling, contributes a paper with this title and reaches these conclusions:

1. Strictly speaking, there is no evidence for an absolute physiological minimum of fat in the diet, provided that the calorie value of the whole diet is sufficient to meet the total energy needs of the body, and to

provide a surplus for fat formation in the body.

2. Practically a certain amount of fat is necessary in the diet, the alimentary canal of man having been developed to deal with a diet in which a considerable proportion of the energy is presented in the shape of fat.

3. In the diet of the infant at the breast fat gives over 50 per cent of the total energy.

4. After weaning and for the next few years of life, up to six years of age, the main source of fat in the diet should be milk and butter. This fat should probably represent about 35 per cent of the total energy of the diet.

5. From six years onward the fat of the diet should represent from 20 to 25 per cent of the total energy, provided that there are no excessive demands on the energy output of the body. This proportion can be increased considerably—for example, up to 35 per cent—without any deleterious effects. The proportion of 20 per cent may be regarded as a minimum. Any increase upon this would be determined by the supplies available, it being borne in mind that fat is not only the most concentrated but also an expensive form of energy to the body. Animal fat is probably at least three times as expensive a source of energy as carbohydrates derived from vegetable sources.

6. As soon as the demands of the body become excessive—for example, 3600 calories to 5000 calories or more—it is unprofitable to attempt to meet the increased demands by means of carbohydrates alone, the limiting factor being probably the size and digestive powers of the alimentary tract. The proportion of fat in the diet in these circumstances should, therefore, be increased up to 30 or 40 per cent. It is a question requiring further consideration whether the energy requirements of a rapidly growing, active lad should be met in the same way by an increased proportion of fat in the diet.

These conclusions may be interpreted in terms of grammes of fat for the different classes of the community in accordance with their energy requirements as follows, it being borne in mind (1) that the fat figures represent what I have called the minimum desirable ration; (2) that, given an otherwise adequate diet, these figures can be diminished without serious detriment to the health of the individual, though probably not without inconvenience and diminution of efficiency; and (3) that they can be considerably augmented without interfering with efficiency or with health.

In the following table the total calories are those proposed by Lusk and adopted by the Inter-Allied Scientific Food Commission. The gross figures refer to calorie value of food as purchased, and allow for a total wastage of 10 per cent.

Age in Years.	Total Calories per Day.		Fat in Grams.	Fat Calories per Cent of Total.
	Gross.	Net.		
0-6	1,650	1,500	62	35
6-10	2,310	2,100	62	25
10-13	2,750	2,500	74	25
13-20—				
Males	3,300	3,000	88	25
Females	2,750	2,500	74	25
Adult average bodily workers:				
Males	3,300	3,000	70-88	20-25
Females	2,750	2,500	60-74	20-25
Adult sedentary workers:				
Males	2,750	2,500	60-74	20-25
Females	2,200	2,000	47-60	20-25
Adult very heavy bodily workers	3,000 to 5,000		120-160	30

THE TEACHING OF PHARMACOLOGY.

At the last meeting of the *American Medical Association* Meltzer made some excellent remarks on this subject, according to the *Journal*. He said a pharmacologist should have a year or two of training in the practice of medicine before he starts teaching pharmacology, and not only in a hospital where the physician is practically not responsible to any one, but in private practice.

The percentage of mortality is not the only thing which the physician has to know; he must know how to relieve. Then the pharmacologist should free himself

from the idea that his task consists in teaching the physiologic action of drugs on normal animals. He must know and teach the action of drugs on pathologic individuals. He must give up further the old notion that pathology is nothing else but physiology in different conditions. Antibodies, etc., are not physiologic products; they are peculiar to pathologic states.

Numerous patients get well without any drugs; but it should be kept in mind that they get well not by accident but by definite treatment, the treatment consisting in the use of newly formed antibodies. That is nature's school of pharmacology, and the teacher of pharmacology will do well to take a thorough course in this school. Furthermore, the pharmacologist should keep in mind that one and the same drug may have a profound effect on a pathologic state and have no effect whatever in a physiologic condition. An antipyretic may reduce a temperature from 105° to 99° F., but will not be capable of reducing the temperature even by one degree when administered to a normal individual. We may give a large dose of alcohol to an infected patient without producing any signs of intoxication, while only a small fraction of that dose may cause intoxication of a healthy individual.

Then the pharamacologist should cultivate in the student the point of view of a scientific physician; a drug which does no harm should be administered even if it offers a chance of only 5 per cent of doing good to the patient. That is the practical side of the physician. But the same physician must learn to be critical and not to draw conclusions from the mere fact that the patient who received a certain medicine recovered from his disease; he may have recovered in spite of the medicine and not because of it.

Finally, a pharmacologist should not teach too much; he should not teach pharmacology from big volumes. The pharmacologist himself should know which things are most essential to the physician and confine himself in teaching mostly these essential things. But the student should have a knowledge of these things on the tip ends of his fingers. Pharmacology and therapeutics should not be separated into two disciplines. Pharmacology should be taught for its practical application first and for knowledge second.

After Meltzer finished his remarks Fantus added these words: "There is a great deal of importance and truth in what Mr. Meltzer has just said. However, his specifications of requisites for the teacher of pharmacology, I fear, are quite impossible of realization. Life is too short for a man to become a laboratory expert and a clinical expert as well. Many of our present teachers of pharmacology are, unfortunately, not even competent to teach in the whole domain of pharmacology. Many of them are merely students and teachers of pharmacodynamics—that is, the study of the action of drugs—and know very little about pharmacy or prescribing. The result is that these vital topics are not taught properly. The pharmacologist is essentially a laboratory man, and as such cannot be at the same time a clinician. The teaching of therapeutics should be in the hands of clinicians. To place it, as has been done in some institutions, in the hands of the pharmacologist is, in my opinion, an unfortunate and pernicious practice."

THE USE OF UNNA'S DRESSING IN THE TREATMENT OF LEG ULCERS.

HAPPEL, in the *Journal of the Missouri State Medical Association* for October, 1918, states that the plan of treatment which has been most successful in his hands and has never failed, where the patient was under sufficient control so that the ulcer could be dressed as often as necessary, consists in the use of Unna's dressing. It is made up of gelatin, four parts; zinc oxide, four parts; glycerin, ten parts; and water, twenty parts. The gelatin is broken up into small pieces and placed in the cold water, which is then heated in a water-bath until it is melted. The glycerin is stirred in and the zinc oxide added, little by little, until thoroughly incorporated. It

is then poured into a can with an air-tight cover and set aside until needed. It solidifies when cold, and before application must be placed in a vessel of water and heated until melted, which takes place at 110° F., a temperature which can be borne without discomfort on the skin.

The leg is shaved, if there is much hair, cleansed with soap and water, the ulcer with peroxide, and dried. With an ordinary ten-cent brush the liquid is painted on the ulcer and the leg from the level of the head of the fibula to the metatarsophalangeal articulations. Over the ulcer a square of six or eight thicknesses of gauze is placed, and a coat of paint over this. A two-inch gauze bandage is applied snugly from the toes to just below the knee, carefully covering the heel. A second coat of the dressing is painted on and covered by gauze bandage. A third coat is covered by a third bandage, and over this a gauze bandage is applied until it is dry, to protect the clothing, when it may be removed. This makes a clean, neat, snug, elastic boot, which does not interfere with wearing the shoe or walking.

In from four to eight days, according to the quantity of discharge, a stain will be noticeable over the site of the ulcer, when a window must be cut so that it may be inspected. If the discharge is considerable the dressing should be removed, the parts cleansed as before, and a new one applied. If not, local applications may be made to the ulcer through the window and dressings held in place by a bandage until the boot becomes too loose, when it must be taken off. The ulcer will be found to be noticeably smaller, with a floor of healthy, granulating tissue at the edges reaching the level of the skin and surrounded by a bluish border of newly formed epithelium. The second dressing can be worn for a longer time, sometimes for ten or twelve days, before the staining is perceptible. As soon as the ulcer becomes clean (free from infection), and approximately level with the skin, grafting should be performed. The advantages are rapidity in healing and the formation of skin more nearly approaching normal, having greater elasticity and thickness, permitting freedom of movement, and rendering subsequent injury less likely than when covered with the thin epithelium formed by granulation.

The operation is very simple and can be done under a local anesthetic, but better under a general anesthetic. The ulcer and thigh from which the skin is to be taken are cleansed with soap and water, no antiseptics being used; the thigh is shaved if necessary. The skin of the thigh is made taut between blocks held by the assistant on the inner and outer aspects and a thin ribbon is cut with an ordinary razor, using a saw-like motion. Care should be exercised to insure complete separation of the graft before attempting to remove it. It is transported on the blade of the razor to the ulcer, and then with a straight needle, or applicator, the free end is held in its proper place and the razor withdrawn slowly so that the ribbon of skin falls smoothly on the surface of the ulcer. It must lie flat, with no air bubbles beneath, no edges turned under, and the grafts should touch but not overlap the skin edges. Other grafts are cut and placed in position, with a small gap intervening, until the surface of the ulcer is covered. After each one is placed, the razor and thigh must be wiped clean and dry, as blood interferes greatly with the process.

The ulcer is then covered with narrow strips of gutta-percha tissue, placed checkerboard fashion, over this gauze wet with normal saline solution, and then gutta-percha tissue, held in place by a bandage. The gauze is removed daily, the grafts flushed with warm normal saline solution, and fresh moist gauze applied. On the fifth day after operation it will be found that the grafts have adhered sufficiently to permit the removal of the gutta-percha strips. Moist gauze is reapplied, unless the skin has become water-soaked, in which case dry gauze is employed, but greater care must be used in dressing it to prevent pulling off some of the grafts. In about two weeks the grafts will have spread sufficiently to cover the whole ulcer. It is

necessary that the patient be kept in bed, or at least with the leg in the horizontal position, for a week; after that Unna's dressing may be applied and the patient permitted to walk about.

When the ulcer has healed it is best to have the patient wear a supporting bandage of stockinette, or elastic webbing, from the toes up, applying it on arising and removing it on retiring, until there is no longer a tendency to edema.

CLINICAL ASPECTS OF INFLUENZA.

Berg and Bullowa in the *New York Medical Journal* of October 12, 1918, say that the relation of the streptococcus to influenza is about that of this organism to scarlet fever. While the streptococcus in both these diseases is the most important bacterial cause of the mixed infection complications, which cause the death-rate, it is not the essential and bacterial cause of either of these diseases. An antiserum to the streptococcus will therefore prove disappointing, while an effective polyvalent antiserum to antagonize all the organisms involved in the mixed infections, including the pneumococcus, has not been produced.

The pneumococcus in these cases belongs to strains III and IV. They believe, therefore, that antibacterial therapy is still the hope of the future and not the realization of the present.

For the fever they have not used any of the coal-tar products, all of these being heart depressants. Aspirin in moderate doses they have used only in the first to the third day. In some cases, instead of aspirin they gave salicylate of soda in moderate doses, with double the amount of bicarbonate of soda. In using salicylate of soda the urine should be carefully watched for albumin. After the fourth day, if the fever is an annoying factor, neither of these drugs should be used. They have used hydrotherapy in the form of sponge baths at 85° every time the temperature rises above 103.5°, such baths being preceded by a dose of quinine sulphate or hydrochloride in five-grain capsules. Not more than ten grains of quinine are to be given daily. As stimulants, they use tincture of digitalis by mouth or by veins as indications require. The digitalis should be given frequently in moderate doses. The pulse should be the guide for its use. They are both using adrenalin in moderate doses, three to five minims of 1-to-1000 solution by mouth, nostril, or needle, as indications may require. On account of its effect on the edematous mucous membranes, and because of its stimulant cardiac properties, Dr. Bullowa considers that it has a specific effect. Other indications are met therapeutically as they arise.

The pneumonias in this disease being mostly bronchopneumonias of the "moist" type with a tendency to partial pulmonary edema, they have carefully avoided the use of opiates and morphine. Only in very severe cough are small, infrequent doses of codeine given until the cough is relieved. For the delirium with sleeplessness they rely upon barbital in proper doses. The patient awakes from the sleep with a much clearer mentality.

ALOES AS A LOCAL SEDATIVE.

Cock in the *British Medical Journal* of September 7, 1918, states that it has long been known that aloes is a local sedative. This is shown by the formula for friar's balsam, in which aloes is a considerable ingredient. The balsam is used for bites of all sorts, as well as for other wounds, and still is a good application. He thinks, however, that a saturated solution of aloes in tincture of tolu is a much pleasanter form. It is, as far as he knows, the only thing that relieves the virulent itching of harvest-bug bites. It should be kept in a stoppered bottle, shaken before use, and by applying the stopper to each bite once or twice before scratching the relief is great. By going over the whole body when stripped for bed a good night is obtained. He speaks from experience, both personal and from the reports of patients.

In addition, he advocates the use of tincture of tolu in bronchitis kettles instead

of compound tincture of benzoin. Here, after the aromatic portion has volatilized, the peculiarly disagreeable odor of aloes persists, whereas the tolu remains pleasant all the time, and is at least as soothing an antiseptic as the friar's balsam.

OVERFLOWING TEARS (EPIPHORA).

KEARNEY in the *Medical Record* of October 5, 1918, gives the following summary of his views:

1. Overflowing tears is the result of stenosis of the lacrimal drainage apparatus not attended by inflammation.

(*a*) A stenosis of the punctum or canaliculus is corrected by a Bowman's slit of the lower canaliculus.

(*b*) A stenosis of the lacrimal sac or nasal duct is corrected in 25 per cent of the cases by passing a rapid dilator through the slit canaliculus to the inferior meatus of the nose. Nearly all of the remaining cases are corrected by placing a leaden style in the lacrimal drainage channel and allowing it to remain six months or more. An excision of the palpebral portion of the lacrimal gland or an extirpation of the lacrimal sac is done if the above measures fail to check the overflow of tears.

2. Overflowing tears is the result of stenosis of the lacrimal drainage apparatus attended by inflammation.

(*a*) An extirpation of the lacrimal sac is imperative when the epiphora is the result of a chronic catarrhal or phlegmonous inflammation of the lacrimal sac.

(*b*) The extirpation operation of preference is the one in which the lacrimal sac is removed through the slit canaliculi.

PITUITRIN: ITS USES AND ABUSES.

BROBERG in *Minnesota Medicine* for October, 1918, states that in his opinion the contraindications to pituitrin are: contracted or deformed pelvis, rigid cervix or perineum, very high blood-pressure, eclampsia, and malposition of fetus.

The indications are:

1. If pains are weak or irregular in first stage of labor, give one-half of a one-half Cc. ampoule, or if cervix is very readily dilatable give one-half Cc. and no more.

2. If pains are weak or irregular in second stage, give one-half Cc.

3. In postpartum hemorrhage give 1 Cc. with ergot.

Broberg states that pituitrin has come to stay with us, and has found a place in the obstetrician's armamentarium. But if the slogan of the hour would be "safety first" as it is with the railroads, and if the doctors were not in such a hurry to get back on some other case, but would wait patiently with the woman in labor, injuries and fatalities could be avoided. Accoucheurs are coming to realize that the child has a right to be born alive, and that the license to practice medicine does not also carry with it a license of executioner of the unborn child any more so than of the mother.

Pituitrin has been used in too large doses in obstetrics, and it has caused many serious lacerations, as well as fetal deaths. But it will expel the contents of the uterus, at term, quicker than anything else, therefore is given by busy practitioners to hurry up the case and for no other reason than expediency. De Lee says: "It provides for the physician and his brother gynecologists a lot of chronic sufferers, often incurable even after mutilating operations."

THE TREATMENT OF SEBORRHEIC ERUPTIONS.

BARBER and SEMON in the *British Medical Journal* of September 7, 1918, state as a result of their investigations:

1. That there is a constitutional state, which may exist from infancy or may appear *de novo* in adults, and which may be termed the status catarrhalis or exudativa (Czerny). Where this condition exists the skin and mucous membranes show an abnormal susceptibility, not only to various bacterial infections, but also to mechanical and chemical irritations.

2. Persons in whom the status catarrhalis is present, either permanently or temporarily, are liable to develop the

multitudinous eruptions which have been variously termed seborrheic eczema or dermatitis, true eczema, pustules, boils, and the wrongly termed "impetigo"—really an impetiginized seborrheic eczema. These manifestations, in whole or part, are intimately dependent on or associated with the existence of an underlying dyscrasia, to which they have ventured to give the name.

3. There is considerable clinical and therapeutic evidence to suggest that all patients with the status seborrhœicus are suffering from a relative acidosis. They are of the opinion that this condition may have resulted from a diminution of the intake in the food of the fixed bases—the mono- and di-sodium phosphates, and the carbonates, which are normally present in fresh fruits and vegetables, and which are largely responsible for the maintenance of an exact alkaline-acid equilibrium in the blood and tissue fluids.

4. As a practical outcome of these considerations there is abundant clinical evidence of the value of alkalies in the treatment of seborrheic eczema.

MERCURIC CHLORIDE IN MALARIA.

The *British Medical Journal* of September 14, 1918, states that in 1916 N. Barlow found that one of the most striking effects of intravenous injection of mercuric chloride in combination with the administration of quinine was the very rapid reduction of an enlarged spleen, justifying the hope that the combination may establish a complete cure more rapidly than quinine alone. Grieg and Ritchie (E. D. W. Grieg and W. D. Ritchie, *Ind. Journ. Med. Research*, Calcutta, 1917, V, 401-7) have tested this by taking 54 control cases on 30 grains of quinine in three oral doses daily, and 50 cases treated in the same way as regards quinine, but in addition, by intravenous injection, on alternate days for eight injections, of 11 Cc. of a solution of mercury bichloride 1 in 1000 in saline. All the patients were chronic malarial subjects from East Africa and Mesopotamia, who had been under treatment for six months or more in India, and the spleen was three fingerbreadths or more below the costal arch, except in two, in which it was two fingerbreadths. The cases were more chronic than Barlow's. As complications of the injections salivation was noted in two cases, slight phlebitis in three or four, diarrhea in five, and two cases had febrile relapses and temporary splenic enlargement while under treatment.

Although not confirming Barlow's observations fully, the results show that the combined treatment has a greater effect in reducing splenomegaly than quinine alone has; thus, whereas under quinine alone the treatment failed in 16 cases, under the combined method failure occurred in 7 only. The reënforcement of quinine by mercurial injections may therefore be recommended.

[We would think that this treatment would be contraindicated if the kidneys were not in perfect health.—ED.]

A STUDY OF SEVENTY CASES OF CEREBROSPINAL MENINGITIS.

SEHAM writing in *Minnesota Medicine* for October, 1918, as a result of this large experience gives the following advice:

In the premeningitis stage, if the spinal fluid is clear, the serum may be used intramuscularly or intravenously, preferably the latter, but if signs of meningeal irritation have developed the intraspinal method alone, or combined with either of the two mentioned, must be used. Parke-Davis serum was used in the majority of his cases; in some Lederle, in a few Mulford, and in three chosen cases the serum from the Rockefeller Institute. The minimum number of injections to one patient was two, the largest number forty-four; the average number to each patient was seven. The general rule was to give the serum daily for five days, and then, if the fluid was clear, the general condition of the patient much improved, the serum was discontinued.

The dose of the serum has never been standardized, since we have no definite measure of potency. The average dose

used for children was 15 Cc., providing that 15 Cc. or more of spinal fluid was removed at the same time. It is not safe to give more serum than spinal fluid withdrawn. In adults 30 Cc. was usually given, and in several instances, where excessively large amounts of fluid were withdrawn, 45 Cc. of serum was given. There is too great danger in giving a large dose at one time of causing undue pressure. If a dry tap was obtained, or only a few drops of spinal fluid, between 5 and 10 Cc. of serum was given. The administration of serum must be considered a major operation. The patient must be watched very closely for signs of collapse. Sophian's method of accurately recording the spinal pressure during the giving of serum must be a very safe procedure, even though it is not considered practical by all authorities. He was not in a position to use this method, because of the very large number of patients and the lack of assistance. The respirations, especially, should be watched, and at the first sign of collapse either camphorated oil or cocaine and atropine should be given hypodermically, and if respiration stops, artificial resuscitation should be employed. Also, at the same time, the tube containing the serum should be lowered, in order to allow the serum and the spinal fluid to flow out. Six of the patients showed such collapse, and these occurred before the gravity method was instituted. At first the syringe apparatus was used entirely; the fluid was directly injected with a syringe, but a death resulted with this method, and the so-called "gravity method" was used entirely thereafter. Very frequently the patient complained of severe pains in the back, legs, and head, sometimes at the beginning of the injection, but usually after. This pain is very severe and may persist for some time. Warm serum has been recommended to lessen the pain, but it possessed no definite value.

The so-called "water anesthesia," allowing the patient to suck water through a tube while the serum is being administered, is recommended by Sophian. The pain is, at times, so severe that the patient's attention cannot be diverted, and again, the patient may be semicomatose; Seham did not find this method valuable. He used no anesthetic whatsoever, except in one case, in which laughing-gas was used. A general anesthetic is useless in this condition, and so also is local anesthesia. If the patient is very unruly, and assistance is lacking, an anesthetic may be necessary in order to do a lumbar puncture.

WHEN TO DISCONTINUE THE SERUM.

1. The condition of the spinal fluid.
2. General condition of the patient.

At the onset of the disease the spinal fluid is nearly always cloudy, contains many extracellular organisms and many pus cells, and is under increased pressure. Usually at the end of five daily injections of serum the fluid clears up, the organisms disappear, and there are very few pus cells, or none at all. At the same time the patient's mental condition improves, the temperature drops, and the rigidity of the neck and extremities decreases. The serum should be discontinued under these conditions. After this a lumbar puncture, for a period of another week, should be done upon alternating days, to see whether the fluid remains normal. Even though clinical signs have improved, if the fluid should become cloudy again and pus cells and organisms return, the serum should be immediately readministered. If one is uncertain, the patient should always be given the benefit of the doubt, by the injection of serum. The fluid clears up, on an average, about the tenth day.

THE TREATMENT OF SCARLET FEVER

WATSON in the *British Medical Journal* of September 14, 1918, points out that there are many ways to treat scarlet fever, and most of them claim but little in the line of striking results. He thinks a glorious uncertainty attends their issue. There is one method—only one that he knows of—which generally makes good. That is the Milne method. It is begun the moment the case

is diagnosticated—sooner if there be reasonable grounds for suspicion. The patient is rubbed with pure eucalyptus oil carefully all over the body, from the crown of the head to the soles of the feet, both morning and evening, for the first four days, then once daily until the tenth day; the throat is swabbed with carbolic oil, 10 per cent, every two hours for the first twenty-four hours. At first the diet is soda-water or hot water and milk in equal quantities; in a few days light diet is allowed; and by the tenth day ordinary meals. For three weeks care must be taken to avoid cold, and patients must be warmly clad. "When the patient is moved from one bed to another before the treatment is used, then first bed and bedding should be disinfected. The same applies to clothes the patient may have been wearing before the treatment." Otherwise nothing need be done — "clothes, toys, books, etc., are harmless."

This in outline is the whole affair, but it works, as many a man who tried it incredulously has been forced to confess. Years of experience of the method have only confirmed Watson's faith in it. Sometimes he has tampered with the original prescription to the extent of substituting for the detested oil swabbing a throat spray of paroleine and medical izal, and the results have proved unfailingly satisfactory—cases have run an easier course than seems possible by any other plan, and infection has ended with the inception of treatment. He cannot say that severe symptoms and complications are impossible, but they more rarely happen. From the purely selfish aspect, what a comfort for the medical man abides in this method's solution of the infection question! Visit your scarlet fever patient when you like, you carry no mischief into other houses; if but the simple necessities of this treatment be observed, a patient's home and its members cannot menace the community. At the period when, attending his own child in his own home for scarlet fever, he put this method to the sincerest test, he had to manage a difficult first labor. The explanation was made to the patient and the alternative of another practitioner offered, even urged; but she insisted, so Watson proceeded. The case necessitated a long chloroform anesthesia, instruments proved ineffectual, and finally podalic version had to be done. Mother and baby did well. Neither in that case nor in a couple of other cases attended during the same period was there any rise of temperature, and he practically lived in the fever room at the time.

THE MODERN TREATMENT OF GALL-STONE DISEASE.

HEMMETER in the *Medical Record* of October 5, 1918, tells us that the course to pursue in aiming at a treatment of cholelithiasis that is based upon the cause would be to first ascertain the specific bacterium which is causing the infection, and thereafter to obtain a serum by inoculating animals with this specal strain of organisms. In one of his cases of chronic cholecystitis with occasional attacks of high fever that followed three months after a severe streptococcic tonsillitis, antistreptococcus serum apparently cured the patient, for she has remained without symptoms for two years and two months.

There is a justified doubt in this case, for there are periods of two years quiescence in many gall-stone cases, after which the cholelithiasis may again give rise to symptoms. Moreover, according to Rosenow, only the particular strain of streptococci that had been derived from a case of gall-stone disease should be used to produce the serum. It is conceivable that the specific strain of streptococci might be cultivated in these cases from the tonsil.

The difficulty will be to secure the proper strain of bacterium which is doing the mischief, but he believes that with patient research by the method of duodenal intubation, and making use of the neurochemical mechanism which controls the sphincter of the common gall duct, marked advances in the diagnosis and therapy of this condition will be made.

The treatment of cholelithiasis has different aspects in view, and varies according

to the diagnosis of the conditions present. It will also vary according to the causes of the conditions.

It is necessary to plan a special treatment for the following four conditions: (1) The gall-stone colic with the acute occlusion of the common gall duct and the recurrent cholelithiasis. (2) Inflammation of the biliary vessel and reservoir system (gall-bladder, cystic duct), the acute cholelithitic cholecystitis, with its consequences: (*a*) perforation peritonitis, (*b*) diffuse cholangitis, (*c*) chronic cholecystitis, with empyema and dilatation of the gall-bladder. (3) The invasion of the deeper bile passages by the stones, chronic occlusion of the gall duct. The differential diagnosis and management of the various types of icterus. (4) The consequences and complications of cholelithiasis and malignant neoplasm of the gall-bladder.

The principle of non-surgical treatment of cholelithiasis is to bring about a period of quiescent latency in the disease. Complicated infections, and all factors that tend to stagnation of the bile, may have stirred up a dormant disease. Of course, this can be treated by operative removal of the gall-stones and draining the gall-bladder. From what he has seen in the preceding, however, only 5 per cent of all gall-stone carriers ever have symptoms. This makes it clear that there must be a great majority of the subjects of cholelithiasis who harbor their stones throughout life with a comparative degree of comfort, or are not aware that they have gall-stones.

Hemmeter is not at all opposed to the operative treatment of gall-stones. On the contrary, he favors it. (See article on "Cholelithiasis" in the Analytical Cyclopedia of Practical Medicine, Volume 3, page 295. He there calls attention to the technique and value of duodenal lavage in the treatment of cholelithiasis.) But there are plenty of patients who refuse to be operated upon, or who never have a second attack, or who have been operated upon already and in whom the cholelithiasis returned; such cases, in short, demand non-operative treatment.

THE NIGHTCAP FOR INSOMNIA.

SELKIRK in the *British Medical Journal* of September 7, 1918, writes entertainingly on this seemingly homely topic. He well says that while the treatment of insomnia in any individual case must depend upon a correct estimation of the particular causes in that case, attention to details likely to assist in wooing sleep must always have precedence over drugs.

From this point of view the wearing of a nightcap takes precedence over the drinking of one. Did our grandfathers and grandmothers think, believe, or know from experience that the wearing of a nightcap encouraged sleep? How did this article come into such prevalent use in olden times? We are not entitled to suppose that the older generation wore it from any vanity or foolishness, but rather to presume that it had knowledge and experience on its side, and had found that it encouraged sleep thereby.

This view is supported by war-time experience of the knitted Balaclava helmet and knitted cap comforter. That the feet should be warm in bed is recognized as necessary for sound, unbroken sleep, but that warmth of the head may be soothing and sleep-winning is not sufficiently recognized at present in civil practice. The war cap comforter is well named. Those who use it at night in cold weather know its soothing virtues in dugouts, shacks, huts, brick-floored billets, and such similar resting-places.

The use and benefit of this accessory might be extended to civilians suffering from insomnia not of gross organic origin. In addition to its soothing sleep-promoting warmth the cap comforter can be used to decrease the intensity of sense impressions from light and sound, encouraging sleep and lessening the chance of its unnecessary interruption, particularly in the early morning.

It is recognized that light and fresh air purify the bedroom atmosphere and make sleep thereby more wholesome and refreshing. A drawn blind, to a large extent, excludes these. The open window, however,

admits the full intensity of sounds from outside and daylight tends to waken the sleeper too early. The cap comforter is used to diminish these sensory excitants. The lower part, folded to a treble thickness, is brought over the ears and eyes. The sleeper then has all the benefit of the fresh air and purifying light without the disadvantage of sensory excitation of the eyes and ears. Extraneous sounds are greatly diminished in intensity and darkness is over the eyes. Thus two real objections sometimes raised by a patient to the open, blindless, curtainless bedroom window are removed. For those who know its value the cap comforter is a potent nightcap.

There is another war-time practice prevalent among soldiers for inducing sleep. As, prior to sleeping, the bird puts its head under its wing, and other animals curl up and thereby lessen the respiratory exchange, so, not infrequently, the soldier pulls his blanket completely over his head to facilitate sleep. He thus obtains increased head warmth, diminished sensory excitation, and a narcotic effect from rebreathing his own carbonic acid. While this practice cannot be recommended as giving healthy sleep it does decidedly promote sleep. As would be expected, such sleep is not so refreshing as fresh-air sleep, and the man is often slow to waken, and in wakening passes through a stupid, confused phase, resembling that of one coming out of a brief anesthetic state. This practice is most useful where sleep is being prevented by coldness of the body due to wet clothing, wet feet, or insufficiency or wetness of blankets. The heavy sleep gives a welcome escape for the time being from the many abominations of the war zone.

THE VALUE OF PITUITARY EXTRACT.

KOSMAH, in the *Journal of the American Medical Association* of October 5, 1918, reaches the following conclusions. He states he can summarize his estimate of pituitary extract by describing it as a valuable addition to our therapeutic resources, but one which must be used with great caution, particularly in obstetric cases. Here it is safe only in cases of simple uterine inertia, particularly in multiparas, when there is no obstruction to the passage of the child, no exhaustion, and the presenting part engaged. It should be used in doses of not over 5 minims at a time, repeated only when the effect of the previous dose has worn off. For the induction of labor, or as an accepted substitute for the forceps, it would be best not to consider pituitary extract. Properly used under proper indications, the extract of the hypophysis has a distinct place and value. Indiscriminate and improper use will only tend to relegate a good therapeutic medium to the discard.

BECK'S BISMUTH PASTE FOR CERVICITIS, ENDOCERVICITIS, AND ENDOMETRITIS.

HOLLENDER, in the *Wisconsin Medical Journal* for October, 1918, states that Beck's method as he has employed it during the past year is as follows:

In cases in which there is an erosion of the cervix, 40-per-cent silver nitrate solution is applied to the erosion and into the cervical canal by means of a small cotton applicator. Immediately thereafter about one drachm of bismuth paste (a mixture of 10-per-cent bismuth subnitrate and 90-per-cent vaselin) is injected into the cervical canal by means of a glass uterine syringe. The paste must not be in a liquid state as is used for injecting suppurative sinuses in other parts of the body; it must be *cold*. In this way the uterine cavity is filled out with the paste, but in so doing the greatest care must be exercised that the paste does not enter the Fallopian tubes. This can be prevented if the operator is exceedingly careful and uses very gentle force. The applications are repeated either daily or every second day, and in some cases two injections weekly will suffice. After the injection a cotton tampon is packed against the cervix for obvious reasons. As a rule the creamy-pus discharge will change into a clear mucus after a few treatments. In those cases in which the discharge is mucopurulent, it will persist a little longer, but

a gradual improvement is sure to be observed in practically all cases.

In reviewing Beck's records, he found that about eighty per cent of his cases ceased discharging after receiving the treatment for a period of from one to six weeks. The remainder did not cease entirely, but in all there was considerable improvement. The results in his own series of fifty cases were to some degree even better. He was able to arrest the discharge in 90 per cent of the cases with from three to ten injections. Of the other 10 per cent two suffered no further symptoms after the first injection, while two failed to appear for the full course of treatment. One case persisted in discharging in a gradually diminishing amount until nineteen injections had been given, when the discharge finally ceased. This was a case of chronic cervicitis of twelve years' standing which had become so severe as to produce symptoms of hysteria. After the cervical infection had been cured the nervous symptoms disappeared. It will thus be understood that the method has been given a thorough test and has proved efficient in over three hundred and fifty cases. Bismuth paste may truly be considered a specific for the eradication of cervical disease.

It should be mentioned, however, that now and then a case will appear in which the old trouble has recurred. Hollender has not had to contend with these, although he was prepared for such a contingency. He recalls a very few who returned with the complaint whilst he was carrying out this treatment for Beck. In such instances where there is recurrence, the symptoms are very mild and hardly noticeable, and after the resumption of the treatment for a week or two no further trouble is encountered. Many times patients will not return for treatment after the discharge has been arrested, thinking that they are cured, and he has come to the conclusion that it is these cases in which recurrence is likely to exist because of insufficient treatment. As a rule, a case is never discharged as cured until smears and cultures prove the uterine discharge normally sterile.

Occasionally Hollender meets cases which he believes are unsuited to this method—or those in which there is even a very slight danger of forcing the paste into the fundus or deeper. For this class of cases he uses a bismuth paste gauze, simply a strip of uterine gauze saturated with the paste, and packs this into the cervix with one end projecting out of the vagina, and held in place by a vaginal tampon. The patient is instructed to pull this packing out within twenty-four hours and follow it with a warm douche.

For vaginal leucorrhea he has yet to meet a better treatment than the packing of the vagina with bismuth paste gauze. This he does twice weekly, the patient using a douche after removing the packing.

His experience has taught him that douches in themselves will never cure a case of cervicitis or vaginal leeucorrhea. He has in the past used various forms of medication for swabbing the vagina, and while some of these have proved efficacious, in many instances they are unsatisfactory.

He has always wondered why Beck has not published the results he has had in treating cervicitis and endometritis. It was not until he put the question to him that he learned his attitude on the subject. Beck thinks that the method is not entirely without danger. Undue force in injecting the paste into the cervix may be the cause of forcing some of the pus within the tubes into the peritoneal space. The result would be a peritonitis. The promiscuous use of the method, especially in the hands of the novice, would thus be the cause of much trouble, and would render it a harmful procedure. In the hands of one who gives this subject some degree of study with the consideration that it should have, and with the proper selection of the case, the treatment is almost certain to be a success, and is without danger if the points of technique are carried out as has already been described.

Beck's opinion is as follows:

"I was afraid that the general practitioner all over the country might use the method indiscriminately and produce a great deal

of harm. There are several millions of women in this country who have so-called leucorrhea. A great number of these could be cured if this method could be applied by those who have had experience with it, but imagine if the practitioner who has not the proper instruments would use an unsterilized syringe with a long nozzle and some three or four ounces of the paste, without much thought of the after-results. For this reason the matter must be handled with great care and caution."

THE PASSING OF THE CURETTE, OR THE CONSERVATIVE TREATMENT OF ABORTION.

MOSHER, in the *Journal of the Missouri State Medical Association* for October, 1918, tells us that observation over a period of years in the wards of the Kansas City General Hospital has convinced him that the routine treatment of abortion by the curette was followed by untoward morbidity and unnecessary mortality. Three years ago the technique of a conservative method of handling these cases was adopted by the attending staff after careful consideration of the records of the preceding five years where curettage had been the unvarying procedure.

The results of the new method have been so universally satisfactory, and in some cases so astonishing, that it is felt the duty of the staff to lay the facts before the profession.

It is to be borne in mind that none of the minor surgical gynecological procedures is so spectacular as a curettement. Nothing would seem *prima facie* as logical as the emptying from the uterus of a mass of decomposing foreign material, which was causing chills, temperature, and hemorrhage. Hence every gynecologist and many men in general practice made it the regular plan of treatment to use a curette, sharp or dull, in all abortions which came under their observation.

In order to show by contrast the results of the conservative treatment as compared with the former radical method, one hundred cases were taken from the records between 1910 and 1913, at which time every surgeon in the hospital promptly curetted all cases which came into his service. The interne who copied the histories recorded the number of days in the hospital, the period of gestation, alleged cause of abortion, amount of hemorrhage, temperature, and complications, and these were used as a check against which 350 cases treated expectantly were pitted.

Based on these 350 cases the Kansas City General Hospital method of conservative treatment of abortion seems to us to be conclusive. In the last four years they treated all cases alike, by the expectant plan, and the results are given below.

In the 100 cases in which the curette was employed to empty the uterus—1910 to 1914—they find the average number of days in the hospital 22.5, and in the new expectant series 8.3 days, which, considered as a matter of civic economy alone, is a reduction of two weeks expense to the city, leaving out all consideration of the welfare of the patient. When it is realized that the overhead expenses, per capita, in the hospital are $3.40 per day, and they average ten abortion patients, this alone should cause a reformation from the point of view of the taxpayer.

The number of complications of the perituterine adnexa are, in the curette series, 72 per cent, and in the conservative series 5 per cent. The mortality has been reduced to *nil*. The only deaths in the past two years in the ward for abortion cases were of two women who had been curetted before entering the hospital.

A plan of treatment which is so radical a change, and more especially one which substitutes the doing nothing for a heroic operation, naturally excites antagonism, and friends of the patient frequently demand that she be not neglected, that the womb must be cleaned out. However, the results of Fowler's position, a dose of magnesium sulphite, the ice-bag over the abdomen, and an occasional hypodermic of morphine ⅛ gr., has been so gratifying that, with reference to abortion, the passing of the cu-

rette is only recognized as an instrument of historical interest, and not as a therapeutic measure.

Cases are given a small dose of pituitrin, if a stimulant is required, and, if hemorrhage is encountered of sufficient quantity to justify it, the cervix is packed, with every precaution as to surgical asepsis, and as a rule when the packing is removed the mass comes away with it.

It goes without saying that every case is considered a threatened abortion, and treated by rest in bed, ice-bag, and morphine sulphate until symptoms carry it into the class of incomplete abortion.

In the first place, even in the hands of the expert gynecologist, it must be admitted that curettage will not empty the uterus in the majority of cases. After a positive assurance that the curettement is complete and the mass entirely expelled, they are frequently embarrassed by having a series of pains set up in from twenty-four to seventy-two hours, and the subsequent discharge of remains of fetus and secundines show that the opinion was not well founded.

When it is considered that through the freshly opened sinuses of the uterine mucosa we prepare a way by which may be absorbed into the lymphatics and the blood stream infective materials, it is safer to let sleeping dogs lie, and not disturb the efforts nature has made to throw around the war zone a barrage of leucocytes to gas the attacking patrol of cocci which menace the life of the victim.

[We emphasized these points in a leading article in the GAZETTE in the issue for December, 1917.—ED.]

THE EFFECTS OF VARIOUS SYSTEMIC AGENTS ON SUPERFICIAL HEMORRHAGE.

HANZLIK, in the *Journal of Pharmacology and Experimental Therapeutics* for September, 1918, states that the data obtained indicate that adrenalin was the most effective of all the agents tested. The changes in bleeding and blood-pressure are reciprocal, and practically irrespective of the original level of pressure. That is, the rise of blood-pressure produced by adrenalin was always accompanied by a prompt and marked diminution or arrest (from 30 to 100 per cent) of hemorrhage. The maximal hemostatic effects appeared in about eight minutes and the hemostasis lasted for about fifteen minutes (range from eight to forty minutes). There was a relative rise of blood-pressure of 125 to 816 per cent, and this was dependent upon dosage, which was variable (0.5 to 1 Cc. per kilogramme of 1:10,000 solution).

In the majority of three experiments with tyramin, bleeding was diminished, but not near as markedly (20 to 76 per cent) as with adrenalin, and the dosage was much greater. Hence it appears to be less effective.

The results with pituitary were variable. In two experiments there was an increase in bleeding with increase in blood-pressure. In one experiment a small dose produced an increase in bleeding with a fall of pressure, and a larger dose (0.5 Cc. per kilogramme) in the same animal reduced the bleeding while the blood-pressure was raised. From this pituitary does not appear to be reliable as a hemostatic.

THE EFFICIENCY OF LOCAL HEMOSTATICS.

HANZLIK, in the *Journal of Pharmacology and Experimental Therapeutics* for September, 1918, concludes that:

1. Beginning with the most efficient, the order of efficiency of the more important of all the hemostatic agents tested is adrenalin, pituitary extract, tyramin, acetic acid, ferric chloride, quinine-urea hydrochloride, tannin, sodium bicarbonate, barium chloride, cane-sugar, sodium chloride. A number of other agents which were tried can lessen local hemorrhage in variable degrees, but on the whole they are inferior and undesirable for various reasons.

2. The following among the more important of this class, and for which hemostatic claims have been made, were found to in-

crease bleeding on local application: cotarnine salts (stypticin and styptol), antipyrin, peptone, emetine, sometimes alum. Orthoform (1-per-cent solution) also quite markedly increased local bleeding.

3. Under the conditions, kephalin, coagulen, and thromboplastin were all variable, or did not affect the course of bleeding.

TREATMENT OF DIPHTHERIA.

HOYNE, in the *Archives of Pediatrics* for September, 1918, states that, when deemed necessary, strychnine should be administered only for a brief period to tide over some emergency. He believes that the indiscriminate giving of strychnine from the time a diagnosis of diphtheria is made until the disease has run its course is extremely likely to produce dire results. Under such circumstances the effect on the already weakened heart is much the same as might be expected from constantly beating a partially exhausted horse which is laboring under an excessive load, namely, collapse. The chief requisite of the heart in diphtheria is rest. If stimulants must be given over a prolonged period, some form of digitalis, in his experience, has usually produced the best results. The chief value of strychnine, it seems to him, is as an emergency measure in case of collapse. But if strychnine has been used throughout the course of the disease, little good can be expected of it at such a time.

As to the subject of diphtheria antitoxin, two particular elements must always receive consideration: (1) determination of dosage, and (2) mode of administration. As to dosage, age and sex should exert no influence in the decision of the matter, and it is his belief that weight should not be the determining factor. To say that 100 units per kilo in an average case and 500 units per kilo in a severe case is the limit of antitoxin needed, regardless of the duration of the disease or the site of the membrane, does not impress him at all favorably. A child who has been sick for four days certainly demands a larger dose of antitoxin than one who has been ill but a single day. In other words, the amount of production and absorption of toxin from the local fibrinous exudate will depend upon the number of days the membrane has existed. And the more toxin formed the more antitoxin will be required to combat it regardless of the patient's weight. Another vital factor is the site of the primary infection. In a nasal or nasopharyngeal case the absorption of toxin is very rapid, hence the usually marked toxemia in such a type of the disease. On the other hand, in a purely tonsillar case, the absorption of toxin is not nearly so marked, and, other things being equal, the dose of antitoxin required is not nearly so large. It must be remembered too that the purely laryngeal cases seldom die as a result of toxemia. In this class the chief danger lies in the threatened asphyxiation as a result of mechanical obstruction, or death follows a bronchopneumonia, which is so common in this type. Consequently, in this form of the disease, while an adequate dose is needed, primary concern must be given to relieving laryngeal stenosis, which may demand either intubation or possibly tracheotomy.

So while each case must be judged upon its individual characteristics in arriving at the proper dosage, it is his experience that the following scale will serve as a fair guide:

1. Purely tonsillar cases from 5000 units to 10,000 units.

2. Laryngeal, 10,000 units to 15,000 units.

3. Pharyngeal (including tonsils), 15,000 units to 25,000 units.

4. Nasal or nasopharyngeal, 20,000 units to 50,000 units.

The foregoing doses will vary somewhat according to the duration of the disease, and the possibility of more than a single type occurring in the same patient must not be overlooked. Such a scale as outlined lies between the two extremes, the very small and the massive, which have been advocated. In most instances where the eye, ear, vagina or wounds are involved, the in-

fection is secondary to one of the other types and the scale will still be applicable.

If possible, the maximum amount of antitoxin required for a given case should be administered as soon as determined. Nothing is to be gained by a division of the dose—by repeated small doses. Whatever is required is required at once. Nevertheless, where an error of judgment appears to have been made, there is no reason why an additional quantity should not be injected.

Diphtheria antitoxin has been given in almost every conceivable manner: by mouth, by rectum, intraspinally, intrapleurally, and intraperitoneally, as well as subcutaneously, intramuscularly, and intravenously. The last three methods are the only ones worthy of consideration.

The subcutaneous method, long the route of common selection, is now being very generally superseded, in hospitals at least, by the intramuscular injection. By means of the latter absorption is much more rapid, and thus the beneficial effects more quickly observed. Moreover, in spite of one's natural suspicion of the accuracy of this assertion there appears to be no doubt that much less pain and discomfort follow than when injected subcutaneously. The choice of location for the intramuscular injection lies between the gluteal muscles and the muscles at the outer side of the thigh. Personally, he prefers the latter.

Finally there is the intravenous route. This should be the ideal method. However, it has many objections as well as strong points in its favor. The introduction of antitoxin directly into the circulation must, of course, be expected to produce prompt results. And it is a fact that in many cases in which the prognosis seems hopeless, after a lapse of twenty-four hours, the prognosis will look favorable and patients be saved by the intravenous injection who otherwise were surely doomed. Some of the chief objections to a general adoption of this route are, however: (1) it is unsafe to attempt such a procedure outside a hospital; (2) it is often impossible to insert a needle into a vein of small caliber without dissecting down upon it; (3) shock following the injection is frequently very severe, with alarming symptoms of collapse; and (4) should a case which has received antitoxin intravenously not survive, there is sure to be a feeling in some quarters that the physician is wholly responsible for the outcome.

When a desperate case—and this is truly the proper class of cases for this method—is given antitoxin intravenously, several points should be borne in mind. After selecting a vein at the bend of the elbow—usually, though, almost any other may be chosen—and applying a constrictor proximally, the vein may be transfixed by a straight needle, passing through the vein at right angles. This immobilizes the vein and prevents it slipping away from the antitoxin syringe needle. The antitoxin to be given should not be taken directly from an icebox and injected cold as he has seen done; but, before injecting, the antitoxin in its container should be immersed in warm water until the temperature is brought up to 98°. No injury to the antitoxin will result from doing this. Five to ten minutes should then be consumed in injecting from 5000 units to 10,000 units. With such precautions shock can often be averted. Additional antitoxin, 10,000 units to 20,000 units, may be given intramuscularly at the same time if it seems advisable. Of course it is understood that all work must be done under strictly aseptic conditions.

As a final word, it should be mentioned that at least we have a method which offers great hope for the reduction of diphtheria morbidity, if its application can be generalized. In fact, it now appears to Hoyne that there is no reason why diphtheria should not be reduced to almost the same degree as smallpox was through vaccination. He refers to the use of toxin-antitoxin (T. A.) for establishing an active immunity.

Without going deeply into the historical side in experimental work on prophylaxis to diphtheria through active immunity, it may be well to relate that Theobald Smith

worked along this line between 1907 and 1912. Others (Babes) had done somewhat similar work as early as 1895. However, it was not until after the publication of Theobald Smith's conclusions that von Behring took the matter up and developed the toxin-antitoxin method of active immunity, which is now being used to a limited extent.

The method briefly stated is as follows: One unit of antitoxin, combined with the amount of diphtheria toxin which this one unit will neutralize, is put up aseptically in a sealed glass ampoule. Three such ampoules constitute a prophylactic dose for establishing an active immunity. The contents of one ampoule—one Cc.—is injected subcutaneously under aseptic conditions at intervals of from five to seven days. There may or may not be any constitutional reaction following the injections. The same holds true in regard to local reactions. When reactions occur they are seldom as severe as sometimes seen with the antityphoid vaccine. At present the same quantity of T. A. is generally injected regardless of the patient's age.

It must be borne in mind that T. A. is in no sense a substitute for diphtheria antitoxin, where an immediate immunity is demanded following exposure. It ordinarily requires from three weeks to three months for the active immunity to be established, but when established the immunity is believed to endure from 18 months to several years, and possibly for life. On the other hand, we know that the average immunizing dose of diphtheria antitoxin is only protective for from ten days to three weeks on the average.

One other point to bear in mind when considering the use of T. A.—individuals with negative Schicks are, of course, already immune, so T. A. is not indicated. Therefore, applying this procedure for immunity in schools or institutions, the routine treatment would be to Schick-test all persons first and give T. A. to those with positive Schick reactions only. In the presence of a diphtheria epidemic or recent exposure to diphtheria, those with positive Schick tests may be given an immunizing dose of antitoxin for their immediate protection, and at the same time the injection of T. A. may be begun in order to ward off diphtheria infection in the future.

Now it may readily be seen what would transpire in a large city in the course of five or ten years if this T. A. principle of immunity was carried out in every school and public institution. In large general hospitals, if all nurses, doctors, and attendants who had positive Schick reactions were to receive this diphtheria prophylactic, it would mean not merely a great saving of lives, but a vast sum of money as well.

SERUM TREATMENT OF PNEUMONIA.

CECIL, in the *New York State Journal of Medicine* for October, 1918, gives the following statement as to the treatment employed at Camp Upton:

In addition to the symptomatic treatment of pneumonia, serum treatment was tried quite extensively, especially on the first hundred cases. A great majority of the Type I pneumonias were treated with the Type I antipneumococcus serum. The results were very gratifying, as will be seen from the fact that out of the twenty cases which received serum only two died, and one of these was complicated by scarlet fever and acute nephritis. In addition to the Type I cases, thirty-five other cases of pneumococcus pneumonia, including all types, were treated with a polyvalent antipneumococcus serum. The serum was sent to us by the government in the early part of the year, and we decided to try it in a few cases in order to determine whether it possessed any therapeutic value. Thirteen of the thirty-five cases died, a mortality of 37 per cent. We inferred from this small series of cases that the serum added nothing to the treatment in these cases—indeed, that it probably did more harm than good—so its use was discontinued.

The technique of serum administration was as follows: As soon as the bacterio-

logical diagnosis of pneumococcus pneumonia had been made, the patient was desensitized by a subcutaneous injection of one-half cubic centimeter of normal horse serum. Five or six hours later, 90 to 100 Cc. of antipneumococcus serum, heated to body temperature, was given intravenously by the gravity method.

Following the injection of serum there was often a slight rise in temperature, followed by a sudden drop of several degrees. In the Type I cases the decrease in temperature was often permanent, but in the pneumonias of other types the temperature usually rose in a few hours to its original height. Serum sickness was noted in a considerable number of the cases, but rarely caused much inconvenience. Typical anaphylactic symptoms were noted in two cases.

The first case was that of a colored man with a Type III pneumococcus pneumonia. Two hours after receiving ½ Cc. of normal horse serum, 100 Cc. of polyvalent and antipneumococcus serum was injected intravenously. Five minutes after the completion of the injection the patient became intensely restless, the pulse was weak and rapid, and there was marked dyspnea and relaxation of the sphincters. These symptoms lasted only a few minutes, after which the patient began to improve and made a complete recovery. No cause could be found for this patient's hypersensitiveness to horse serum.

The second case was also a Type III pneumococcus case. This patient, who had been quite ill, had received one dose of polyvalent antipneumococcus serum (100 Cc.) intravenously without any unpleasant symptoms following. The patient went on to normal convalescence, but had a relapse, and sixteen days after the first injection of horse serum he received another intravenous injection without the knowledge of the laboratory chief. After he had received 50 Cc. of the second dose, the patient suddenly sat up in bed and exclaimed that he couldn't breathe, became very cyanotic, and the pulse was rapid and thready. Dyspnea became more marked in spite of artificial respiration or stimulation. The patient died a few minutes later. This accident could probably have been avoided if more determined efforts had been made to desensitize the patient before the second injection. As it was, he received ½ Cc. of normal horse serum three hours before the larger dose was given intravenously, and this was not sufficient to neutralize the very high degree of susceptibility which he had derived from the first injection of serum two weeks previously. Every effort should be made to prevent these unfortunate accidents, for they tend to prejudice both physician and layman against the use of antiserums.

It is very much to be hoped that an antistreptococcus serum will be produced for the treatment of streptococcus pneumonia, which, so far as infectious diseases go, is the gravest problem which now faces the army.

BUNION: ITS CAUSE AND CURE.

ROBINSON (*Surgery, Gynecology and Obstetrics,* September, 1918) notes that the onset is very insidious and the patient is unware of his predicament until the joint is considerably enlarged and the foot swollen and painful. Then in looking for a cause he invariably blames the shoe for an offense of which it is entirely innocent. Many times the shoes are discarded and new ones take their place. The patients tell the shoe fitter that the old shoes were too tight across the ball of the foot and suggest a size wider. This relieves for only a short time because the head of the metatarsal continues to spread, and soon a size larger is needed. This process is continued until the feet are unsightly, when a chiropodist is consulted. He again blames the shoe for the trouble and tries all sorts of apparatus for the relief of the deformity. Yet it stays, and this is not surprising.

If bunion is a dislocation of the head of the metatarsal bone inward toward the median line of the body, how could a tight shoe produce it?

In all cases of bunion, large or small,

whether they have worn tight, pointed-toed shoes, high heels, or broad, roomy shoes, there is one thing in common, namely, enlarged sesamoids.

The two sesamoids which develop normally under the head of the first metatarsal bone enlarge and grow downward and outward toward the head of the second metatarsal, and as the plantar fascia is tough it resists the sesamoids, and with each step pushes them upward and inward and causes the head of the metatarsal to give in the line of least resistance, which is upward and inward. Because there is no pressure inward on the proximal phalanx of the great toe, it is held firmly by the strong ligaments and gradually the head of the metatarsal is displaced inward. This turns the great toe outward toward the other toes until in many cases the head is almost completely dislocated from the articular surface of the phalanx. The roentgenograms show that this dislocation corresponds to the size of the sesamoids.

By way of preventive surgery, the removal of both sesamoids, as soon as the first symptoms of bunion are discovered, is advised, which can be readily done by the *x*-ray. Then no further development can take place, and the patient will be spared the hideous disfigurement of the feet as well as the suffering, which eventually comes if operation is delayed.

To remove the sesamoids an incision is made commencing at about the under surface of the head of the metatarsal and one-half to three-fourths of an inch back of the protuberance. The prominence is encircled to a point a short distance in front of the joint and on the phalanx, and the flap reflected downward, leaving the bursa intact. Then if there are any sharp points or prominences on the inner side of the head, the bursa is reflected forward on the phalanx and the prominences removed with a sharp chisel. After removing the sesamoids the bursa is replaced over the denuded bone and sutured to the periosteum. The head of the metatarsal can be easily replaced and the toe will come around into position. Then the outer flap is sutured after introducing a small silkworm drain and the wound dressed. It is a good plan to put a small wood splint on the inside of the foot and to bind the great toe to it and to bandage the foot tightly. When the foot is healed a good snug or even tight shoe will be comfortable to the patient.

THE TREATMENT OF TUBERCULOUS EMPYEMA.

HOLMGREN (*Nord. med. Ark.*, Stockholm, 1917; quoted in *Internal Medicine*) since 1908 has treated tuberculous empyema by thoracentesis. The effusion is withdrawn through one puncture opening and air is introduced at the same time through another. Sutherland has recently described a similar method employed by him. However large an empyema may be it can be withdrawn at one sitting without discomfort or risk to the patient. The withdrawals should be repeated at intervals of about a month, and the effusions will be found to become less and less as time goes on, as well as thinner. The period of time elapsing before secretion of pus ceases varies between one and eleven months.

Holmgren punctures with two fine needles. The pus is aspirated through one while air is simultaneously introduced through the other. The spot for the withdrawal of pus is selected as low as possible, usually in the tenth intercostal space between the posterior axillary and angular lines, and this is first anesthetized with novocaine solution. The point for the introduction of air is chosen somewhat higher, as in the next intercostal space above. This is also anesthetized. A Saugman penumothorax needle is used. Before air is introduced the operator must be absolutely certain that the point of the needle is actually in the effusion and not in the lung. The operator must therefore see matter exude through the needle or, if the intrapleural pressure is less than that of the atmosphere, he must hear air being voluntarily drawn in before it is fixed to the air tube. This arrangement makes it possible to observe on a manometer the in-

trapleural pressure during the course of an operation; to regulate it as desired by the pumping of the air, so that the pressure is maintained at a suitable degree the whole time without too violent variations; the final pressure can be arranged as wished. By auscultation of the bubbling air the position of the surface of the effusion can be controlled at any time during the operation. The formation of pus in the puncture channel or of fistulæ occurs very seldom with this technique, possibly owing to the small caliber of the needles.

The prognosis depends in this, as in other methods, mainly upon the extent of the tuberculosis in the lungs. Often the empyema is only the final episode in a tubercular lung affection, so that the mortality must be high no matter what method is adopted. If the stage of the lung does not place obstacles in the way of improvement, the prognosis with this method is good, and the patient can usually attend to his occupation during the whole treatment.

Since 1911 Holmgren has treated 28 cases of tubercular empyema with 17 deaths, or 60 per cent mortality.

CRANIAL DECOMPRESSION FOR HEAD INJURIES ACCOMPANIED BY SIGNS OF INCREASED INTRACRANIAL PRESSURE.

PAYNE (*Surgery, Gynecology and Obstetrics,* September, 1918) observes that it is only in the severe types of head injuries with marked increase of pressure that decompression should be considered, and therefore the severe variety alone should be included in records collected for the purpose of determining the value of subtemporal decompression in these cases. On the other hand many of these severe head injuries suffer profound shock and such severe damage to the medulla that death occurs at once or in a few hours. These cases, therefore, never come within the realm of an operative possibility and hence should not be considered in statistics.

Any severe injury to the head living eight hours after injury should be considered an operative possibility and studied carefully with the view of determining whether a decompression should be done. Many cases, however, recover from the initial shock within the first one or two hours, and in these instances investigation of the various clinical signs of increased pressure should be started at once. When the increase in intracranial pressure rises definitely high one can never tell how soon the fatal stage of medullary collapse may occur, therefore if operation is indicated it should be done as early as possible. The greatest mistake now made in the treatment of these cases is that of waiting too long when operation is indicated. Some of the operative deaths have undoubtedly been due to interference before recovery from the initial shock, but the greatest error made in these cases and the hardest to avoid is that of delay when once the intracranial pressure has reached a high degree.

If a patient sustaining a head injury does not die within the first few hours, there is first recovery from the initial shock, the blood-pressure gradually rises to about normal, and then the signs of inceased intracranial pressure may be studied for the first time. These signs are to be found in the pulse-rate, the eye-grounds, the spinal pressure, and the systemic blood-pressure estimated one or more times according to the indications for or against this procedure.

If there is an extremely high rapid rise in intracranial pressure, there will quickly develop medullary compression with edema, and in this state we will have a fast, increasing pulse-rate, a fall in blood-pressure, negative eye-grounds, and a low spinal pressure. It is needless to say that this is the fatal state, and any operation undertaken in this stage would only hasten the end. If the rise in intracranial pressure is slow but gradually increasing, there will occur a slowing of the pulse, engorgement of the retinal veins, and a rise in both the systemic blood and spinal pressure.

The change in pulse-rate is not only the most readily observed, but the most dependable symptom in our present knowledge. This is probably due to the fact that, of the three vital centers in the medulla, the vagus

is not only the most stable but responds more rapidly to stimulation. When a pulse of 80 or more gradually falls to 60, we should strongly consider a relief of the intracranial pressure. A greater drop to 55 or 50, coupled with a retinal edema and a rise of the blood and spinal pressure, is positive indication for an immediate decompression.

Spinal-pressure estimations in these acute cases are sometimes of much value, but ofttimes dangerous. It should never be done when there is a high blood-pressure or during the stage of marked increase in intracranial pressure. Several deaths have been reported following this mistake. This procedure is probably of more value in subacute and chronic cases and should only be utilized early in the acute cases before there is a decided rise in intracranial pressure.

In grave cases with very high intracranial pressure unrelieved by decompression there will occur, sooner or later, an exhaustion of the vasomotor and vagus centers. This is indicated by a rapidly rising pulse-rate and a falling blood-pressure and invariably means medullary edema and approaching medullary collapse. These symptoms following a previously slow pulse and high blood-pressure in such a case are, therefore, positive contraindications for operations.

Bearing on this same subject, Sharpe states that some of these high pressure cases occasionaly recover without operation, but practically all of them have to reckon afterward with post-traumatic brain and general nervous symptoms, which, it is reasonable to believe, would have been forestalled by a timely unilateral or bilateral decompression. In a communication to *Medicine and Surgery*, 1918 (quoted in *Surgery, Gynecology and Obstetrics*, September, 1918), he says that if the traumatic intracranial pressure is mild, convalescence can frequently be shortened, the headaches be relieved, and the general condition of the patient greatly improved by one or more lumbar punctures. This practine should never be instituted in a patient with high intracranial pressure or in subtentorial lesions for fear of consequent medullary compression in the foramen magnum.

The two periods in which an operation is distinctly contraindicated in cases of brain injury are: first, the condition of shock in the very beginning; and second, the condition of medullary collapse. If these two extremes can be avoided, the rational operative treatment should depend upon the presence or absence of an increase in the intracranial pressure whether there is a fracture of the skull or not. Even the *x*-ray, though important, should never be allowed to delay the operative procedure. Many cases of head injuries at autopsy have revealed no hemorrhage at all, merely a "wet" edematous, swollen brain, but sufficient to cause medullary compression and the death of the patient.

The operation of choice, where operative procedure is indicated, is the subtemporal decompression and drainage. In the absence of localizing signs the decompression should always be performed on the right side in right-handed patients, as the motor speech area of such is in the left cerebral cortex. This route exposes first the silent area (temporosphenoidal lobe); second, the middle meningeal artery and that portion of the skull so frequently exposed to fracture; third, the middle fossa of the skull, the chief intracranial cistern, at its lowest point; fourth, the squamous portion of the temporal bone, the thinness of which makes the operation less difficult.

If the intracranial pressure is so high that the cerebral cortex tends to protrude through the bony opening made, it is frequently wiser in selected cases to perform a similar operation upon the opposite side of the head. It may in some cases, however, be best to wait one or two days for the second operation.

Cushing, quoted in the same journal, states that the operation for a subtemporal decompression is not always easy, and requires experience, facility, and a special type of rongeur forceps, if, without undue injury to temporal muscle, an opening of sufficient size is to be secured. However, there is little doubt but that in many cases

a much more prompt return of consciousness is afforded by this measure than would otherwise occur, and in some cases it may be a life-saving procedure.

The term "cerebral decompression" is often very loosely used, not to say abused. The mere making of a hole in the skull around a depressed fracture, with wide opening of the dura to relieve pressure of a local contusion or infection, led to many disasters earlier in the war; and it is much better to restrict not only the term, but the procedure, as in the case of tumors, to measures directed toward the relief of pressure carried out in a clean field under temporal or suboccipital muscles, with immediate secure closure of the overlying structures. At best, however, a subtemporal decompression is not a measure of very wide scope in the craniocerebral injuries of warfare.

There is a general tendency on the part of orderlies and nurses who may be unfamiliar with head cases, or uninstructed as regards this particular point, to attempt to feed semiconscious patients. A typical bronchopneumonia, brought about by misdirected efforts to administer fluids to patients with inactive swallowing reflexes, is a far from uncommon sequel. It is a good rule to keep every stuporous patient in a semiprone position, and trial feedings should never be first attempted while they are lying on their backs.

A WAR STUDY OF BRAIN SURGERY.

HARVEY CUSHING records in the April number of the *British Journal of Surgery* a detailed study of the treatment of wounds met with involving the brain and its enveloping structures. This is a valuable communication, since the methods adopted by him and his team of workers have resulted in a reduction of the mortality of dural penetration cases—133 in number—from 54.5 per cent for the first 44 cases to 28.8 per cent for the last 45 cases. It seems that there remains still, after three years, less unanimity of opinion as regards the principles of treatment of craniocerebral injuries than of any other type of wounds, and a summary of Cushing's methods will therefore be of general interest.

The material analyzed is composed of 250 cases; of these, 10.1 per cent were scalp wounds, 24.6 per cent involved cranium as well but with intact dura, 60.7 per cent had dural penetration, and 4.5 per cent were massive or bursting fractures. The operative procedure adopted by the writer consists essentially in the removal *en bloc* of the area of bony involvement, the withdrawal by suction through a soft catheter of the devitalized cerebral tissue lining the track, and the extraction of bone fragments with the least possible increase in the trauma already produced. A classification of cases is adopted, less in accordance with the site or character of the cranial involvement than with the seriousness of condition of the cranial contents.

One can only touch here upon a few of the interesting points detailed by Cushing. He warns us against underestimating the possible seriousness of scalp wounds, especially if situated on the longitudinal sinus. In those cases in which there is depression of the inner table trepanation is indicated, of course, but recovery is often hastened by incision of the dura, the dangers of infection, it is stated, being less than has hitherto been feared. Wounds with laceration of the dura and cerebral contusion are favorable cases, in spite of the fact that the meninges have been torn; even though the scalp wound may be grossly contaminated, there is no immediate risk of intracranial infection, since the more or less intact mosaic of bone fragments intervenes, and extrusion of brain substance is uncommon. More serious are those cases, 39 in number in this series, in which fragments are widely indriven; often also cerebral protrusion occurs. Most of these cases are wounds over the parietal area. An interesting feature in these cases is the progressive nature of the symptoms recognized by the patient who, after return to consciousness, is aware of weakness of one leg, or leg and arm, sometimes succeeded by paralysis or spasticity. When the ventricles were penetrated by a

missile death occurred in all cases, probably due to early infection of the cerebrospinal fluid. Not uncommonly the projectile lodges actually in the ventricle. In other cases in this series, in which the ventricle is not penetrated, the mortality was 54.3 per cent, infection again playing the chief rôle.

Cushing, in a final review, holds that the clinical histories of the 219 operation cases have clearly shown a large number of the recorded fatalities to be avoidable—not only by the employment of a still more perfect technique, but by its more prompt application. He is in favor of operating on these cases in the earlier stages and eliminating, as far as possible, the delay in transit for even the more serious cases. The success of his methods certainly adds weight to these opinions.—*Lancet,* August 3, 1918.

WAR WOUNDS OF THE RECTUM.

Mocquot and Fey (*Bull. et mém. Soc. de chir. de Par.,* 1918, xliv) state that among more than 6000 wounded treated in the authors' ambulance, 30 wounds of the rectum have been observed. These include 4 wounds of the peritoneal rectum, 19 of the subperitoneal rectum and anus, and 7 rectourinary wounds. The four peritoneal rectal wounds were penetrating multivisceral abdominal wounds which, besides the rectum, involved other parts of the intestinal tract. Two died shortly after operation. The third case in which the rectal injury had not been discovered or treated died after four days. The fourth recovered. In the 19 subperitoneal lesions the entry wound was almost always in the sacral or buttock region and very frequently accompanied by lesions of the regional bones. Such wounds rapidly become gangrenous and give rise to complications such as fistulæ or strictures. In the 19 cases there were 10 recoveries and 9 deaths.

Wounds of the subperitoneal rectum and anus give three principal indications: (1) treatment of the soft and skeletal parts; (2) treatment of the rectal wound; (3) exclusion of the rectum by an iliac anus.

Five of the 19 cases were treated by simple toilet of the wound without suture of the rectal wound or exclusion of the rectum. In two cases operation was insufficient and the patients died. The other three recovered, but all had a rectal fistula.

Eight cases were treated by toilet of the wound, and suture of the rectal wound without exclusion. Three have been cured, but two have fistulæ; one case is progressing toward recovery; four died. The study of the cases has shown the authors that when in severe cases there are grave peritoneal lesions with large muscular and bone damage, cleansing and rectal suture do not suffice. Ordinarily on account of the spread of infection the sutures hold only for a few days. In two of the cases an iliac anus operation was done, but it was too late; if this had been done in time, the men might have been saved. In two cases the wound was cleansed and an iliac anus created without suture of the rectal wound. Both had severe lesions of the anal canal and of the lower ampulla, with regional bone injuries. Both have recovered.

Two cases with very extensive lesions and in a poor condition had the rectum sutured and an iliac anus created; both died.

The authors think that slight wounds of the rectum may recover spontaneously, but that this cannot be counted upon. Generally, untreated, unsutured wounds are exposed to gangrene or pelvic cellulitis. If the wounds are opened up and treated, but not sutured, they usually recover with a fistula if the damage is not very extensive. The sutures do not always hold and generally give way by the eighth or tenth day, causing a fistula, but even so the chances of early infection are avoided and the parts have time to put themselves in a state of defense.

Exclusion of the rectum by creation of an iliac anus is indicated when the anal canal or ampulla is largely damaged, and especially when there are accompanying extensive lesions of the vicinity. The artificial anus should be made as early as possible.

With regard to technique for wounds of the anterior face of the ampulla, a median perineal incision suffices. For large pos-

terior wounds with sacral fractures, transverse opening alone will give sufficient access. When there is no sacral fracture, for posteroanterior wounds the authors use an oblique incision along the edge of the sacrum and coccyx prolonged as far as necessary either above or below. This gives access to the lateral face of the rectum. For a high lateral rectal wound to which approach is very difficult, the authors think the rectal wound should be sutured either by a laparotomy or by a sacral resection.

The authors treated seven rectal wounds with accompanying wound of the bladder or urethra; four were high rectovesical wounds and three rectourethral. In all of the first variety a rectovesical fistula developed; one recovered, and three died. The three latter cases had an iliac anus.

For rectovesical wounds an immediate cystostomy is the treatment of choice. An iliac anus might in addition be of value if there are extensive surrounding injuries, but the authors did not have cases of this kind. Direct suture is only indicated in wounds of the peritoneal rectum and bladder, but these are abdominal wounds and call for laparotomy; in subperitoneal wounds suturing is not indicated, but rather spontaneous closure is favored.—*Surgery, Gynecology and Obstetrics,* October, 1918.

DAKIN'S SOLUTION AND DAKIN'S OIL IN THE NORMAL PERITONEAL CAVITY OF THE DOG.

GREY (*Bulletin of the Johns Hopkins Hospital,* October, 1918) has shown that both the neutral solution of chlorinated soda (Dakin's solution and dichloramine-T in chlorinated paraffin—Dakin's oil), when injected into the normal peritoneal cavity of a dog, lead to an inflammatory reaction, the degree of which is directly proportional to the amount of chlorine antiseptic used. With a sufficient quantity (less of the oil suffices) death ensues.

When either of the chlorine antiseptics is injected into the gall-bladder of a dog no abnormal symptoms appear. Following the injection of the oil, however, the gall-bladder becomes thickened and shrunken, though the remainder of the biliary tract shows no discernible changes.

A small amount of Dakin's oil, when injected into the normal pleural cavity of an unanesthetized dog, may lead to a rapid (reflex?) death.

Since Dakin's oil, particularly, has been used without recognizable ill effects in certain infections of the abdominal cavity, the results from the experiments outlined above suggest that the wall of an abscess cavity or sinus must play an important part in protecting the peritoneum in general from the effects of the free chlorine. They also suggest that the maintenance of an adequate drainage tract is an indispensable part of the technique for using antiseptics of this nature within the abdomen. Until more evidence is at hand, then, both of the chlorine antiseptics should be used in intra-abdominal infections with caution, and certainly only in carefully selected cases.

AN OPERATION FOR THE RELIEF OF PYLORIC OBSTRUCTION IN INFANTS.

CUPLER (*Surgery, Gynecology and Obstetrics,* October, 1918) thus describes what is his modification of the simplest and safest operation for hypertrophic stenosis of the pylorus.

The stomach is emptied. Ether is administered and the usual upper right rectus muscle-splitting incision made. The tumor is delivered and held firmly between the thumb and index-finger; a longitudinal incision 2 to 3 centimeters in length is made through the serosa and circular muscle fibers down to the thickened mucosa. After the muscle is divided a definite line of cleavage between muscle and mucosa is seen. The incision is spread apart with blunt forceps. When the muscle is sufficiently liberated, the mucous membrane will protrude freely into the wound. There is very little hemorrhage; occasionally a small vessel will require a ligature. Usually the application of a warm pad to the wound edges will control the oozing. In spreading the incision,

it is best to start at the stomach end of the incision, as here the merging of the stomach wall into the pyloric tumor is a gradual process and there is little danger of opening the mucosa, whereas the change from the thick and edematous pylorus to normal duodenum is so sudden that care is necessary to avoid opening the intestine at this point.

The serosa is freed from the muscle for a distance that will allow coaptation of the edges without tension and permit the muscle to remain in the separated position. The serosa is approximated by the application of two or three coaptation sutures. This operation differs from the Rammstedt procedure only inasmuch as serosa is made to cover the mucosa. There are a sufficient number of reports of successful Rammstedt operations on record to preclude the fear of leakage and peritonitis. Still in view of the fact that serosa can be successfully placed over the mucous membrane without materially shortening the operative time this modification is worthy of trial; it gives one more line of defense and leaves a closed wound rather than an open one.

The abdomen should be closed in layers without drainage, the skin closed with linen, and the abdomen reënforced by the application of a wide circular adhesive band. Separation of the abdominal incision has occurred. This complication is not unlikely when we consider the crying and necessary handling of these patients.

The postoperative care consists of early feeding; 2 to 3 drachms of diluted milk four to five hours after the operation, 1 to 3 ounces every four hours on the third day. Overfeeding is to be discouraged, for edema at the operative site may occur and the symptoms return. Withdrawal of food and gastric lavage will usually correct this condition.

The author applied this operative procedure to two infants. Both had a normal postoperative recovery and have developed and progressed perfectly.

After consulting the writings of Downes, Cupler was impressed with the post-mortem findings of an infant dying of endocarditis three months after a successful Rammstedt operation. In this case the stomach removed showed an elliptical cicatrix on the anterior surface of the pylorus about one-half the size of the original wound. The area was covered with serosa and appeared to consist of serosa and mucosa only.

Experience and time may bring out objections to the Rammstedt type of operation, but until something better is at hand this should be the operation of election.

PREPARATION OF DAKIN'S SOLUTION FROM LIQUID CHLORINE BY THE GRAVIMETRIC METHOD.

BENEDICT (*Surgery, Gynecology and Obstetrics*, October, 1918) holds that the best theoretical method for the preparation of sodium hypochlorite solution of known strength is to pass a weighed quantity of chlorine gas into a solution of sodium carbonate. The reaction proceeds as follows:

$$Na_2CO_3 + 2Cl = NaClO + NaCl + CO_2.$$

Weighing the chlorine used is preferable to attempting its measurement by volume for the following reasons:

Greater accuracy, since volume of chlorine gas is subject to change from temperature and atmospheric pressure changes.

The apparatus required for weighing the chlorine is less complicated, less readily broken, and cheaper than that required for the volume-measurement of chlorine.

The process of weighing is more rapid and convenient than measuring the gas.

The following is the procedure for the preparation of ten liters of Dakin's solution by the gravimetric method.

Apparatus and solutions required:

A torsion balance, capacity to ten pounds, sensitive to about 0.2 grammes. (Cost about $40.)

Two one-liter Florence flasks.

A Folin or other suitable absorption bulb.

A tall-form absorption bottle of about 100 Cc. capacity.

A 20-per-cent solution of anhydrous sodium carbonate.

A 10-per-cent solution of crude caustic soda.

A small calcium chloride drying tube.

Suitable rubber tubing (a few feet of thick-walled tubing).

A cylinder of liquid chlorine.

The cylinder of chlorine is connected to the calcium chloride tube with rubber tubing. The other end of the tube is connected with a piece of narrow-bore, heavy walled tubing about three feet in length. About a foot from the end this tube should reach over the balance, with a suitable support to hold it at about the height of the first absorption flask, and so adjusted as to prevent the tube from slipping in either direction. Into one of the Florence flasks is placed 900 Cc. of the 20-per-cent carbonate solution (the solution can be prepared without undue exactness, and can be measured in an ordinary graduate). This flask is fitted with a two-holed rubber stopper, through one hole of which passes the Folin absorption bulb, bent at right angles at the top. Through the other hole passes a short outlet tube, also bent at right angles. The flask is placed on the balance, and the inlet tube connected with the rubber tube from the calcium chloride tube. The outlet tube is connected by means of a short piece of thick-walled tubing to the inlet tube of the small absorption bottle, which should contain about 90 Cc. of 10-per-cent NaOH, and which is placed on the same pan of the balance with the Florence flask containing the carbonate. (The function of this second absorption bottle is to retain the carbon dioxide which is liberated during the action of the chlorine. Unless this gas is retained it would ultimately be weighed as chlorine.) The second Florence flask (which should have a stopper provided for it) is placed on the other pan of the balance, after having been about half-filled with sand or other heavy material. The stopper for this flask is also placed on the pan, and water added to the flask until the two flasks counterbalance practically exactly. With a little practice this counterbalancing requires only a moment or two. Weights amounting to exactly 43.0 grammes are then placed on the pan with the second flask, and chlorine gas is passed into the first flask until the two flasks come to a balance—*i.e.*, until 43.0 grammes of chlorine have been added to the first flask. The chlorine should be bubbled into the first flask at such a rate that not less than 20 or more than 30 minutes are required for the passage of the 43.0 grammes. After the chlorine has been passed in, the flask is disconnected from the inlet tube and from the second absorption bottle and the contents are diluted to ten liters with tap water, taking care to wash the absorption bulb and the inside of the flask thoroughly during the dilution to ten liters.

The method may be employed to advantage for the preparation of five to twenty liters of Dakin's solution at one time, changing the constituents used in proportion to the final dilution. The weight of chlorine used is slightly below theoretical, this being accounted for by the loss of a small amount of carbon dioxide, in spite of the absorber. About 500 to 700 liters of solution have already been prepared by the above method. Never has a correction in reaction (alkalinity) had to be made, and in only one trial was a correction necessary for the hypochlorite content. This latter ranges practically invariably between 0.46 and 0.49 per cent of NaC_{10}.

FREE ADIPOSE TRANSPLANT AS A METHOD OF FILLING BONE CAVITIES.

CAFORIO (*Riforma med.*, 1918, xxxiv, 182) states that only 45 cases of fat grafts used to fill bone cavities are reported in international literature. Only 16 of these were followed by positive results. He reports a successful case which he believes is the first attempt in Italy to fill with fat a large cavity.

The patient was a wounded soldier, the middle third of the tibia having been badly fractured by a shell. As the wound did not heal after several months and showed a fistulous tract terminating in an osteitic cavity, the author determined to clean out the cavity and to fill it with a free autoplastic fat graft. After opening up the fistulous

tract and completely curetting the cavity, a piece of fatty tissue about the size of a mandarin orange was removed from the right buttock. This was gently inserted into the bone cavity, taking care that it was in good contact with all recesses without traumatizing it. A rubber drainage tube was placed with posterior contra-aperture, and the wound closed. The man made a rapid and excellent recovery; forty-three days after operation there remained only a few granulating islets to be epithelialized. The patient may be considered as completely cured, without the least trouble in locomotion.

The author reviews briefly the literature. He has made a number of experiments on rabbits to test the action of fat grafts in filling cavities, and their ultimate fate. The site selected for experiments was the superior tibial epiphysis. In this region the periosteum was carefully stripped open and the bone hollowed out without producing fracture. The cavity was then filled with fat tissue removed from the inguinal region of the same animal, over which the periosteum was again sutured with very fine silk. Eight such experiments were made, the animals killed, and the site of the transplant carefully removed. The details in each case are fully given.

The study of the microscopic preparations from these experiments, while it does not give wholly uniform findings, gives two important conclusions: (1) that the fat graft does not remain *in situ* as such; (2) that it is totally substituted by a new osteoid tissue.

It is of great interest to surgeons to find that there is a definite replacement of the graft by bone. While Makkas had noticed that the osteogenetic process was extremely slow, yet in Caforio's cases there was no trace of the transplant twenty-three days after operation. Caforio gives two reasons for this rapidity of action in his cases: (1) the species of the animal, bone regeneration being vary rapid in rabbits; and (2) the size of the cavity filled. In Makkas's cases the cavity was the size of a cherry or of a nut; in Caforio's, the size of a pea.

There can be no question of the elimination of the graft in these experiments. The author, from the manner of healing, placed all doubt aside as to complete resorption of the graft. The experimental and clinical results led him to conclude that fat grafts are absorbed and replaced by bone tissue; and that as a matter of practical surgery such grafts should be of immense service, especially in the many cases arising out of the present war.—*Surgery, Gynecology and Obstetrics*, October, 1918.

CANCER OF RECTUM.

LYNCH (*Surgery, Gynecology and Obstetrics*, October, 1918) states that cancer of the rectum and colon has increased 100 per cent in the past fifteen years, according to the Report of Vital Statistics of the Registration Area of the United States. Bloodgood has well said that in the life history of every malignant growth there has been a moment when it was surgically curable, and the lesions under consideration offer no exception to this admirable axiom. To recognize and to seize upon this precious moment is no less than to control the life destinies of the affected individual.

Of 491 cases studied the author has operated upon 335. The hospital mortality was 16 per cent. Forty-one have lived one year; forty-five two years; thirty-three three years; twenty-two four years; twenty-six five years, and seventeen six years.

Patients not replying to circular letter have been classified as dead when last heard from. As in all clinics situated in cosmopolitan centers where the population was in constant flux it was impossible to follow a large number of the patients. Thus the statistics as above created are necessarily less favorable than if every case had been followed to date.

Whatever disability existed, as a result of operation, did not interfere with livelihood gaining. One of the patients who was bankrupt when his rectum and sphincter were removed, and who was incontinent at times, has made four trips to Europe and has earned over a million dollars since operation. The author states that he cannot

overemphasize the plain fact that postoperative conditions, no matter how unfavorable as to function, did not interfere with the usefulness or economic independence of the patient.

Incontinence was a relative term. Its importance had been grossly exaggerated. As no horse was sound, so no human body was without defect, and even great defects were compensated for by the natural endowment of the individual to meet such obligations. It was simply a question of getting used to the discomforts of a colostomy or a leaking anus; a psychological phenomenon well worthy of consideration. Think of the innumerable women torn in childbirth who have been incontinent for a quarter of a century, yet who efficiently and without affront to their families perform their daily work. Because of this psychological element he strongly preferred to have a relatively incontinent normal anus rather than to have an artificial one upon the abdomen.

This briefly is the result of surgical therapeusis. These statistics show that rectal cancer operated upon even after great delay and by poor methods is not hopeless. If with these limitations we obtain results, how important therefore is the early diagnosis and how promising the outlook for the future.

What are the important symptoms from the modern standpoint in order of diagnostic and therapeutic importance?

Constipation. This is the very first and earliest of all symptoms. It is undoubtedly protective in type, being perhaps the result of biologic reaction to the influence of the new growth. There are, however, several hypotheses as to its origin depending upon the path of inhibitory transmission rather than upon its origin or occurrence. Of the latter and of its protective nature there can be no doubt. Certainly it is not due to mechanical obstruction of the growth.

Stomach symptoms. Chronic indigestion, so frequently a sign of peripheral pathology, is just as significant of rectal cancer as of a chronic appendix.

Blood or bloody stools. This is usually the first exoteric sign. It can occur without ulceration, in which case it may be due to a blocking of the return circulation in the valveless veins leading to the liver. In any event hemorrhage so commonly associated with cancer (10 per cent of the 491 cases had been operated upon previously for hemorrhoids) is a frequent source of the blood. In a large proportion of the cases, however, it was due to ulceration.

Frequent and imperative desire to move the bowels followed by explosive discharges of gas, blood, and mucus. This symptom is usually spoken of as the diarrhea of cancer. It is not in reality a diarrhea in that feces are rarely passed.

These are the classical symptoms which every gastroenterologist should know. Other symptoms occasionally noted are an indefinite pelvic discomfort and pain or tenderness over the cecum which has been mistaken for right-sided pathology.

A patient presenting any one of the above symptoms should have a rectal and proctoscopic examination as a matter of routine. In the series of 491 cases, 56 per cent of the tumors were within 7.5 centimeters of the anus, 69 per cent were within 10 centimeters of the anus, and 31 per cent were more remote. It is evident, therefore, that more than one-half were within reach of the finger, that two-thirds could have been diagnosed under anesthesia by the finger, and that all except the sporadic cases in the colon could have been diagnosed by the proctoscope.

The duration of symptoms for this series was eight months. During this period many of the cardinal diagnostic symptoms already referred to had been present, so that at any time a diagnosis could have been made had the patient been properly examined.

In this series of 491 cases 4 per cent were under thirty years of age; 7 per cent thirty-five. According to the United States Bureau of Vital Statistics 0.5 per cent of the cases of rectal and colonic cancer were in children under nine years of age, 2.75 per cent under nineteen years, proving that cancer is not confined to any age, and that

while it occurs more frequently in middle life, still for all we must recognize the danger of placing too much importance on age.

In the writer's series of 491 cases extending over a period of nineteen years, 153 were considered inoperable. Of great importance is the history of the advance of our technique and a more liberal understanding of the possibilities. From a study of unexpected results in many so-called inoperable cases, the author is convinced that even in the late cases, except when the peritoneum is involved, there is always a fighting chance. Of the 153 cases considered inoperable, none has been so classified because of the extent of involvement in the rectum itself.

The operability for the total number is 60 per cent. This high percentage is due to the fact that Tuttle kept no record of inoperable cases. By operability is understood radical extirpation of the growth. In the past five years operability has risen to 74 per cent. Let it be clearly understood that this refers to growths strictly localized in the rectum. In many instances it is necessary to perform an exploratory laparotomy to determine whether the growth is operable.

The author has performed the combined operation 111 times; in 36 of these cases it was performed in two stages. It is his operation of choice.

The perineal has been performed 102 times; the abdominal 20. Formerly he used the following operations now in disuse: Kraske, 20; modified bone flap, 32; and intrarectal, 18. When possible, for the psychical reasons already described, he always places the anus at the normal site. He prefers to perform the operation in one stage if it is possible.

The perineal operation is the operation of choice in very fat or in extremely debilitated people. In all cases, as a matter of routine, he always removes the coccyx. Preliminary colostomy is always done when the growth is within two centimeters of the anus, in order to prepare for the extensive removal *en bloc* necessitated by lymphatic involvement.

WAR INJURIES OF THE FACE AND JAWS.

Ivy (*Surgery, Gynecology and Obstetrics*, August, 1918) notes that fistulæ resulting from war wounds practically always are connected with the parotid gland and its duct, injuries in the submaxillary region rarely being followed by salivary fistulæ.

All the authors divide these fistulæ into two forms: (*a*) glandular fistulæ; (*b*) fistulæ of Steno's duct. An idea of the relative frequency of these two forms may be gained by noting Morestin's figures. Since the beginning of 1915 this surgeon has treated 62 salivary fistulæ, 30 being glandular and 32 involving Steno's duct.

According to Dieulafe, clean incised wounds involving the parotid gland usually heal spontaneously. The destructive wounds caused by modern war projectiles, always complicated by infection which involves the individual lobules and acini of the gland, frequently lead to fistulæ.

The fact that a fistula exists may be hidden for some time, being masked by the inflammatory phenomena which give rise to suppuration. In these cases the fistulæ are preceded by a slowly progressive salivary tumor, varying in volume from day to day. After recession of the inflammatory phenomena, there is observed at a place on the surface of the masseter or in the sternomaxillary space a small reddish point, flattened or acuminated, at the site of which is established a flow of thin, clear liquid, limited to a few drops when the jaws are at rest, becoming abundant and at times excessive during the movements of mastication. The diagnosis can be in doubt only in cases in which a very small fistula exists or where suppuration of the parotid wound is still very marked; in these cases, if observation of the production of secretion is not sufficient to establish the diagnosis, the functioning of the gland is provoked by touching the lingual mucosa with a drop of vinegar or by making the patient masticate a small piece of hard bread; there will then be seen streaming abundantly from the fistulous point in veritable jets a clear, thin fluid. The patient himself may make the diagnosis

by noticing a marked increase in the flow of liquid at meal-times, and may be literally inundated by the saliva which runs down his cheek to his clothing.

The fistulous openings may be multiple, but those generally observed are single. The site of the lesion varies, all of the region occupied by the parotid being subject to traumatism or suppurative complications by extension from the original wound. Spontaneous closure of glandular fistulæ sometimes occurs, but not so frequently after war injuries as after those seen in civil practice.

According to Pietri, the location and direction of the wound in relation to the intraglandular ducts have an important bearing on the gravity of the case. The principal intraparotid collecting duct emerges from the anterior border of the gland at the junction of its upper and middle thirds. Anatomical considerations show that a wound situated farther from the median collecting duct will involve a rather large number of collateral branches, while a wound of the upper or lower portion of the gland will involve, especially if superficial, only small unimportant branches. Spontaneous healing often occurs in these latter cases.

If the wound is parallel to the principal parotid duct and situated very close to it, the lesion will involve, near to its point of junction with the main collecting channel, all the collateral branches coming from the portion of gland above or below the lesion, resulting in an obstinate salivary fistula. In a vertical wound of the parotid, the median duct may or may not be involved. If the median duct is spared the collateral branches involved will often be unimportant, and in any case will be few in number, so that the external flow of saliva will be relatively slight, and healing of the wound easily accomplished. If, on the contrary, the vertical lesion involves the central duct of the gland, the flow of saliva from the wound may be very abundant. All of the saliva carried by the collateral branches mesial to the section will flow out by the wound. Furthermore, since the presence of valves regulating the flow of saliva in the excretory canal has not been demonstrated, a portion of the saliva emptying by collateral branches distal to the section may be discharged through the wound instead of into the mouth.

Surgical intervention in a case of this kind, in order to have some chance of success, must aim not only to direct into the mouth the flow of saliva discharged into the duct behind the solution of continuity, but also to prevent at the same time the discharge through the wound of saliva entering the anterior portion of the canal. The second part of this problem seems easily achieved, but the first, on the other hand, may appear impossible, owing to continuous secretion from the posterior part of the gland interfering with cicatrization of the wound.

The multiplicity of procedures proposed proves that no one of them can be used exclusively for all cases. Dieulafe discusses most of the methods of treatment that have been employed, such as compression, excision of the fistulous region followed by suture, oily injections, etc. He briefly dismisses immobilization of the jaws as a method of treatment *per se* with the remark that many cases will heal spontaneously when the jaw is free and mobile, and that persistence of the fistula is found just as often among patients who have had the mouth closed during a long period as among those who have all the time preserved their masticatory movements.

Pietri, on the other hand, believes that the simple procedure of immobilization of the jaws should be tried first in all cases before resorting to operation, claiming that it is logical to favor healing by diminishing the production of saliva through the suppression of the function of mastication and reducing gustatory sensation. He uses a skull-cap of woven material which prevents the mouth from being opened. In certain cases it is advisable to combine this with intermaxillary ligation or splinting of the teeth. The patient is given liquid diet for several weeks, and abstinence from speech as far as possible is enjoined. As the fis-

tula is seen to close, in the return to normal, the diet is increased by gradual stages. It is not known what becomes of the parotid gland in the course of this treatment, but it probably enters simply into a state of rest, and then, with mastication, if the excretory duct is permeable, it takes up again its normal function. It cannot be claimed that this method of immobilization of the jaws is infallible; however, it is so simple, and the results obtained are so encouraging, that it is always worthy of trial. Pietri's observations are based on 38 cured cases.

Dieulafe recommends cauterization with silver nitrate for small fistulæ draining slightly and limited to small groups of acini. Cauterization with a fine thermocautery point has also given him good results. The accessible portions of the parenchyma are reached directly through the fistulous tract by application of the cautery two or three times at three or four days' interval. This may be too insignificant to justify an operation. In these cases Dieulafe makes an incision above and below the fistula (always in the direction of the fibers of the facial nerve), and through this little opening he touches with the cautery all of the exposed surface; he then curettes or excises the cutaneous tract and reunites the skin with horsehair or silk threads. One of the foregoing methods is indicated particularly for small fistulæ following intraglandular suppuration.

REVIEWS.

CLINICAL MEDICINE FOR NURSES. By Paul H. Ringer, A.B., M.D. F. A. Davis Co., Philadelphia, 1918. Illustrated. Price $2.

This small volume represents the substance of lectures on medical diseases, so-called, which the author delivered for several years at the Asheville Mission Hospital. He has placed his lectures in book form because he did not find any nursing literature in book form which seemed to him adequate in presenting the facts which nurses require. The author does well in dealing scantily with the bacteriology and pathology of disease. He has turned his attention chiefly to symptoms and their meaning, with complications and their results. There can be no doubt that these two lines are those with which the nurse should be most familiar.

The author also has wisely excluded the discussion of physical signs, as these do not come within the nurse's occupation. The wisdom which he has shown in excluding physical signs might, we think, have been extended to the exclusion of treatment; but on the other hand it is only fair to state that he has not attempted to teach a nurse how to treat diseases independently of the physician, but rather how to meet emergencies until the physician can arrive.

The book is well printed on good paper, and because it does not attempt to be exhaustive is all the more valuable for the class of readers for which it has been prepared.

ANNUAL REPORT OF THE SURGEON-GENERAL, UNITED STATES NAVY, to the Secretary of the Navy for the fiscal year 1918; Bureau of Medicine and Surgery. Government Printing Office, Washington, D. C., 1918.

As one would expect, the report of the Surgeon-General of the Navy for 1918 contains much more which is of interest to the general profession and to the public than reports which are made in peace times. This report also contains a large amount of statistical matter which only those who are interested in statistical matters will desire to study.

In addition to these statistics, which take up a comparatively small part of the volume, there is an immense amount of interesting information given in regard to the medical, dental, and nurse corps; the medical representatives in war zones; emerg-

ency hospital construction, hospital and ambulance ships, reports of fleet surgeons and surgeons in charge of naval hospitals; diseases of special interest; and recruiting. There are also reports upon psychiatric research; special investigations; rehabilitation and vocational reëducation; and all this presented in a manner which is clear, concise, easy to read, and, therefore, in a form which leads one from page to page because of its importance and value.

The country is to be congratulated upon the fact that, during these times when the expansion of the Navy has been so extraordinary, there was at the head of the Bureau of Medicine and Surgery a Chief who possessed extraordinary executive ability, and in addition that very necessary qualification of being able to meet emergencies as they arose and to present his facts to his superiors in the government in such a telling and effective manner, that he was given to a large extent the means which enabled him to accomplish the task set before him.

As the war comes to a close it must be a source of much gratification to the Secretary of the Navy and to the Surgeon-General of the Navy that the Medical Department has been ready at all times to meet every call that was made upon it promptly and efficiently, and if any one doubts this statement of fact because he is not familiar with many details concerning it, we suggest that he obtain and read the Bureau's Report for 1918.

THE DISEASES OF INFANCY AND CHILDHOOD. Designed for the Use of Students and Practitioners of Medicine. By Henry Koplik, M.D. Fourth Edition, revised and enlarged. Copiously illustrated. Lea & Febiger, 1918. Price $6.

Dr. Koplik's book even when it appeared in its first edition was a distinctly original contribution to pediatrics, containing many new illustrations, and it was written largely from his own experience.

As with many other works it has increased materially in size with each edition, so that the present volume contains over 900 pages. Particular revision has been made of the chapters dealing with Acidosis and in those dealing with the various infectious diseases, notably Diphtheria, Poliomyelitis, and Meningitis. So, too, careful revision of the sections upon Syphilis and Tuberculosis has been made and the more recent methods of precision in the diagnosis and treatment of circulatory diseases have received attention.

We are interested in noting that the author has found it possible to get satisfactory pulse tracings from children in private office work. This is a difficult task even in the case of many adults, and still more so for obvious reasons in children.

The colored plates, which are original, are excellent. Possibly the one which will interest our readers the most will be that one in which is shown the so-called Schick test to determine whether a patient is immune to diphtheria.

Dr. Koplik's book, as we have already said, possesses marked originality and yet in no way ignores the works of other men on the same theme. It can be highly recommended to specialists and to the general practitioner.

EQUILIBRIUM AND VERTIGO. By Isaac H. Jones, M.A., M.D. With an Analysis of Pathological Cases by Lewis Fisher, M.D. Freely illustrated. J. B. Lippincott & Co., Philadelphia, 1918. Price $5.

The importance of the subject with which this book treats has greatly increased with the introduction of aviation, and has still more been emphasized by the employment of flying as an important factor in war, since so much depends upon the individual's qualifications and on his ability to maintain a normal equilibrium and to avoid vertigo and associated symptoms. The book contains 130 illustrations, is printed in large type, well leaded, and deals exhaustively with the subject of which it treats. Indeed it may be considered as marking an epoch in the literature of the internal ear and those portions of the nervous system intimately connected therewith.

Dr. Jones has long been known for his great interest in this subject and for the valuable studies which he has made concerning it, and his opportunities as a major in the Medical Reserve Corps of the United

States Army during the last two years have of course been extraordinary.

A journal devoted to therapeutics is not one in which an exhaustive review of a book of this kind is particularly appropriate. We can state that those who are interested in this subject will find not only all the methods of examination carefully and competently told, but illustrations which will aid them very materially in making tests and in understanding the results obtained from them.

AMPUTATION STUMPS. By G. Martin Huggins, F.R.C.S. Oxford War Primers. London: Henry Frowde. Oxford University Press: Hodder & Stoughton, Warwick Square, E. C. 4, 1918. Price $2.75.

Huggins, who regards this branch of surgery as distinctly orthopedic, considers himself as qualified to write thereon because he has been responsible for the treatment of about three thousand amputated cases during the past year.

The ideal stump is of such length as to enable the artificial-limb-maker to fit the most useful type of appliance; it should be covered by skin and subcutaneous tissue, which makes a loose but not redundant investment, and which should be mobile over the end. It usually takes three months to harden and shrink sufficiently for the fitting of an artificial limb, nor should the latter be molded until this shrinkage has taken place.

It is interesting to note that periosteal flaps are advised, which is contrary to the generally accepted views on this subject. The minimum length of a useful forearm stump is given as three inches measured from the tip of the ulna. Muscular patients with even four inches of ulna are unable at times to wear a formal bucket. This difficulty may be overcome by removing the fleshy bellies of the forearm muscles.

The questions of reamputation at points of election and the fitting of artificial appliances are taken up in satisfactory detail. There is a chapter devoted to painful and tender stumps, one to sinuses and necrosis, one to joint deformities, and a final one to miscellaneous considerations, under which are included temporary peg-legs, the treatment of skin affections, crutches, and the measurements required for the fitting of artificial limbs.

BIPP TREATMENT OF WAR WOUNDS. By Rutherford Morison. London: Henry Frowde, Oxford. University Press: Hodder & Stoughton, Warwick Square, E. C. 4, 1918. Price $1.

This book is an account of Morison's method of wound treatment, which he regards as so simple that a clever surgeon is unnecessary for the achievement of the best results, though a careful one is essential. He believes that if it is possible to get to the bottom of an infected wound so that it can be thoroughly cleaned mechanically and suitable antiseptics be applied, the wound can be closed at once with interrupted sutures, always with infirmity, and many times with the prospect of finding it healed when the dressing is removed for the first time at the end of three weeks. This fact has been proven by hundreds of cases. Bipp is a paste made up of iodoform two parts, bismuth subnitrate one part, liquid paraffin one part. The paste should be rubbed smooth and is not especially sterilized.

Under usual antiseptic precautions the infected wound or abscess cavity is exposed to its bottom, is cleansed with dry sterile gauze mops, curettes, etc., and all dead tissue is removed. The wound surface and surrounding skin are then mopped with methylated spirit and dried. Bipp is rubbed well into the raw surfaces by means of dry gauze, all excess is removed; if admissible, the wound is closed by interrupted sutures carried to its bottom and a thick absorbing dressing is applied which may be left in place for days and weeks.

The application of this technique is given to fractures, necrosis, sinuses, bone cavities, joints, and amputations.

A warning is given against too liberal application of the paste, which may lead to bismuth or iodoform poisoning, or both.

The author discusses his method with an enthusiasm which has evoked a limited following.